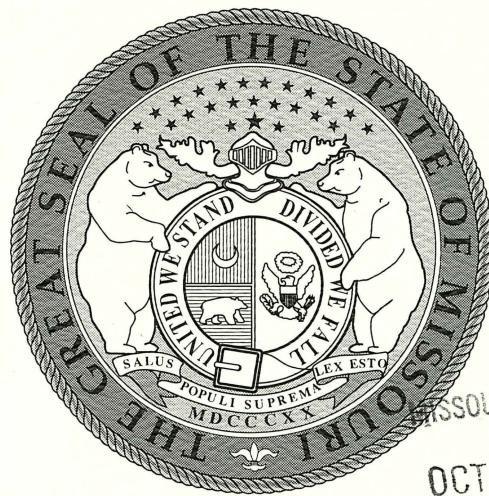


THE FINAL REPORT

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**AUTOMATION
TASK FORCE**

AUGUST 31, 1994

**COMMISSION ON MANAGEMENT
AND PRODUCTIVITY**

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Automation Task Force

Executive Summary

Background

The Commission on Management and Productivity was convened by Governor Carnahan in February 1994 to conduct a major review of state government, evaluate its strengths and weaknesses, and prescribe reform. This has been a collaborative effort between the executive branch, legislative branch, and the private sector to analyze issues and develop solutions for improving management and enhancing customer service in Missouri state government. Six task forces developed recommendations and implementation strategies on the following issue areas: fiscal policy, workforce, efficient operations, management improvement and customer service, automation, and strategic planning.

The Automation Task Force was charged with the mission to "develop strategies to improve existing information technology and create a plan to establish an infrastructure which supports innovative management solutions." During the course of their work, the task force collected and analyzed data, researched initiatives in other states, and conducted interviews and focus groups with state employees. This report details the results of their analysis and their recommendations on automation issues.

Recommendations

- 1 *Implement an ongoing strategic information technology (IT) planning process which addresses statewide acquisition, implementation and application of information technology. The substance of the IT plan should coordinate directly with the State of Missouri's overall Strategic Plan, as one is developed.*

The task force identified the following management and utilization issues related to information technology. First, there is a lack of statewide direction for the acquisition, implementation, and application of IT. It appears IT is driven by the functional needs of agencies as opposed to an overarching statewide vision. Second, many computing services are redundant; others are incompatible and defeat interoperability and interconnectivity. Third, there exists an electronic isolation of agencies (i.e., "islands of information") causing continuing dependence on paper transfer of data, delays in communication among agencies, inability and/or inefficiencies in assembling critical data for decision making throughout government which directly impacts the cost, effectiveness and productivity of state government as a whole. As a result of all of these factors, the State is not well positioned to enter the next generation of IT which requires interoperability between these "islands of

information." The task force believes effective *planning and leadership* are needed to address and resolve these issues.

The centerpiece of this recommendation is the development of an IT strategic planning process that addresses the needs of the State as a whole, the common needs of all state departments, and the individual needs of each. A new Office of Information Technology would be created, directed by a Chief Information Officer (CIO), and charged with responsibility for statewide planning and coordination. In addition, an IT Planning Board (comprised of high-level policy officials and members of the private sector) and an IT Advisory Board (comprised of state data processing managers) would be empaneled. The CIO would receive guidance from the IT Planning Board on policy changes and actions, and on formulation of the state's IT strategic plan. The IT Advisory Board would set technical standards, select and sponsor new technology research and development activities, and conduct operational and tactical planning. The two Boards would work in partnership to implement the statewide IT strategies.

2 *Integrate state government mainframe computing resources.*

Since 1974, the Office of Administration has operated a large data center and offered computing resources to numerous state agencies which purchase computing services in lieu of owning their own mainframe computers. Other agencies have elected to purchase and operate their own mainframe computers. Currently, there are six independent mainframe data centers located in Jefferson City. Three factors are common to the six data centers and make consideration of sharing resources important: a) all are based on essentially the same software technology; b) all plan to continue operating large mainframes for some time; and c) all report that expansion of capacity will be necessary in the future.

Private industry has embraced the practice of consolidating large computing resources as a means of procuring critical IT services at minimal cost. The task force assumed that the state's objective is also to secure high quality computing resources at the lowest cost. Operating six independent data centers in Jefferson City does not achieve this objective; nor is it functionally necessary. Therefore, the task force recommends the state move decisively to consolidate these data centers.

Consolidation is a complex project and requires careful planning. Historically, there has been little incentive for departments to work cooperatively in the area of IT consolidation. Departments may be reluctant to give up their mainframe processors due to fear of losing control over the implementation and execution of applications. For this reason, it is recommended that the affected departments participate in the development of a plan that does not jeopardize their respective missions.

3 *Consolidate the state telecommunication networks to improve management, planning, operation, and expansion of available functions.*

The data network maintained by the State consists of numerous independent, high speed communications networks, primarily dedicated to single state agencies, resulting in significant resource duplication and uncoordinated planning. Agencies typically design, install, operate, and expand their data networks with limited regard for sharing of equipment and communications bandwidth. The result of this infrastructure is a costly and ineffective statewide data network environment.

An effective data communication network infrastructure is required to meet the expanding service needs of the state. The communication environment of the future will require the merger of voice, data and video services into a single network architecture. Several other states have started the planning, development and installation of their communication systems and are positioning themselves to offer significant improvement in services to the citizens of their respective states. Missouri must address this issue quickly in order to develop the communications infrastructure required to enable high quality services in the future.

The task force recommends the consolidation of management of voice, data, and video communication services into the Office of Administration. This single, consolidated departmental structure would promote the coordinated planning, design, implementation and support of a statewide network. In conjunction with this consolidation, standards should be created which identify products and services (including network protocols, software and equipment) which will be used to develop a single statewide communications access system. In addition, a statewide network communications plan should be developed to forecast requirements for a three-year horizon, assess the architecture needed to support the state's communications infrastructure for the next ten years, and identify immediate cost saving opportunities associated with consolidation.

Introduction

The mission of the Automation Task Force of the Governor's Commission on Management and Productivity was to *develop strategies to improve existing information technology (IT) and create a plan to establish an infrastructure which supports innovative management solutions.*

The purpose of the Automation Task Force was to:

- a) *describe the current condition of IT in state government,*
- b) *identify strategic concerns in current planning and operations which prevent greater performance and missed business opportunities relative to benefits to Missouri citizens, and*
- c) *propose a course of action for the state to achieve better performance for its publics.*

The Automation Task Force believes this report contains an accurate assessment of the current condition of IT in Missouri government, the identification of primary concerns which are impeding progress in the business of state-level governing, and recommendations which are essential to the enhancement of IT in Missouri government.

The Automation Task Force recognizes that considerable natural inertia exists in organizations which either prevents change or makes it "acceptable" to accomplish in such incrementally small steps as to be of marginal benefit. The challenge in Missouri government is to provide decisive and pervasive leadership to develop a results-oriented information technology climate.

Over the past six months, the Automation Task Force has used its collective experience in both public and private sectors, to develop strategies to move Missouri forward to face the information technology (IT) challenges of the next century. An integral part of this process has been a partnership with those in state government who are most directly affected by our recommendations. Our final report is reflective of a close working relationship with the Data Processing Managers and Data Center Managers who provided research, background information and guidance throughout the process. It is these employees who will design and implement the processes that will ensure the success of our recommendations.

The business of Missouri state government is *resources, services and information.* IT is the infrastructure which enables state government to gather and distribute resources, provide services and disseminate information. While much of the IT required to operate government is in place, it tends to be sub-optimized for individual agency benefit when considered with the strategic needs of state government. The attached Automation Task

Force Final Report identifies problems and solutions, and suggests a framework within which IT resources should be managed and developed.

While the imperative to achieve short-term savings as a result of the COMAP deliberations is obvious and desirable, the Automation Task Force feels that the long-term and less obvious effects of our work will yield far greater savings and cost avoidance opportunities, for example:

- ▶ There should be a statewide strategic plan for agencies to cooperate to maximize the enterprise-wide use of existing or future data resources or IT infrastructure.
- ▶ Agencies obtaining costly and sophisticated hardware and software should do so with sufficient planning and leadership to maximize its utility and meet the overall needs of the agency or the state as an institution.
- ▶ More direct/indirect support and training is needed for individual employees or work groups whose productivity is dependent on these IT tools. The result will be a workforce that is fully prepared to utilize and exploit the IT tools provided.
- ▶ More state government information should be moved from paper toward electronic dissemination. This will allow greater efficiencies and convenience for state agencies and the public.

The legislature has funded computer hardware and software purchases in an effort to reduce or hold steady personnel expenditures. This strategy has worked well for the last twenty years; the state would never have been able to sustain the growth in government programs and direct services which the bureaucracy is expected to support, without the investment in IT to leverage the productivity of state employees.

However, the state is now entering the next generation of IT which requires interoperability between "*islands of information*". Missouri needs to build data bases which are accessible to any state agency. In situations where privacy is not an issue, one record of a citizen's name, address, phone number, etc. should be adequate. With effective application of IT, fewer employees will be needed to manually complete reports, answer phones, or supply routine information to citizens or private enterprise. Less direct, in person, appearances will be needed to conduct routine business with state agencies.

The Automation Task Force believes that Missouri state government is not well positioned to respond to additional demands for resources, services and information, without a corresponding increase in resources. The Task Force believes that effective planning and leadership are currently needed more than new funding to address and

resolve these issues. This report specifies three action areas which are crucial to the short- and long-term success of IT and the vital state services that are supported by IT:

- ▶ ***Planning, Support and Organization of IT***
- ▶ ***Consolidation of state data centers***
- ▶ ***Consolidation of state data networks***

A window of opportunity exists to begin redirecting significant resources in identified direct IT expenditures during the first year. The tangible recommendations in this report are conservatively expected to yield \$3-5 million in annual savings in the first year. In addition, the Efficient Operations Task Force has identified a minimum of \$24 million in savings by reengineering the state's procurement process to fully automate the procurement function, including electronic invoicing.

Recognizing that state salaries are the largest single expense to the state, the Automation Task Force also believes that IT, when properly planned, supported and implemented, will yield significant productivity gains and improvements in customer service. While unmeasurable in dollar savings, this alone should justify the recommendations in our report.

The Automation Task Force unanimously agrees that the cornerstone from which these savings will be derived is an effective enterprise-wide IT strategic planning process; and strong, forward-thinking IT leadership, which is conceived in our final report as a *Chief Information Officer*. There is broad agreement on each of the principles upon which our report is based; the state must move expeditiously to address the fundamental issues delineated herein.

Recommendation #1

Strategic Planning

Recommendation

Implement an ongoing strategic IT planning process which addresses statewide acquisition, deployment and application of information technology (IT). The substance of the IT plan should coordinate directly with the State of Missouri's overall Strategic Plan, as one is developed.

Background

A number of management and utilization patterns of state-funded human and material resources, some directly associated with IT and others potentially benefitted/leveraged by its application, were documented during the course of information collection by the Automation Task Force. The following broad concerns arise from the analysis of the information collected.

- There is a lack of statewide IT direction for today's challenges and those of the next century.
- Most state government agencies do not conceive themselves as business enterprises and having "business partners" in other economic sectors, i.e., private industry. Their policies, and particularly their practices, reflect this cultural view.
- State government, as a whole, does not uniformly and consistently engage in intermediate and long-range IT business planning.
- Presently, IT appears driven by the functional needs of agencies, rather than an overarching, statewide vision.⁽¹⁾
- Many state-funded computing services are redundant; others are incompatible and defeat interoperability/interconnectivity.
- The state needs to enhance its strategic and tactical efforts to maximize the capability of the workforce, both professional and support, to use IT to achieve greater productivity.

(1) It appears that many low- to mid-level organizational units within state agencies are optimizing their functioning and effectively applying various types of IT. These activities may be sub-optimal when considered with the strategic needs of state government.

- Hardware and software interoperability standards are lacking within and across agencies, particularly in the area of personal computers (PCs), thus reducing the functional uses of existing IT capacity.
- The state does not aggressively conduct research and development activities for the purpose of identifying promising IT applications for its business problems.

The findings of the Automation Task Force point to the need for increased central leadership in IT, but it is also noted that the authority already exists in statute for the Office of Administration (OA) to provide such leadership. Chapter 37, Section 37.005, RSMo, (see Appendix A) assigns the Commissioner of Administration duties in this area. Under a prior administration, OA was directed to terminate control functions with state agencies in the area of IT. Years later, it could be very difficult for OA to reorient its statutory authority in this area.

Missouri state government, including the executive, judicial and legislative branches, neither separately nor in total, has an overall Strategic Plan. Nor do any of the three have an IT plan which addresses its business needs, nor the needs of consumers of state services (see Table 1).

Regardless, all branches of government have spent large sums of money (see Table 1), generally on isolated computerized applications, with even larger investments guaranteed in the future.⁽²⁾

Due to agencies purchasing computers and related equipment "off the IT budget" (see Table 1) and because funds are spent for IT in so many other ways which are not readily apparent in agency budgets, determination of the level of actual IT expenditures in many agencies is essentially impossible. (In most agencies, it is not possible to determine the level of IT expenditure by asking the central administrative staff. The Automation Task Force learned that it is sometimes necessary to go three and four levels down in large organizations to determine this information.) This is particularly true at the current time because PCs and related equipment and software appear to make up the bulk of new purchases (see Appendix B), and because contract IT consultation/programming is widely used. Moreover, these are the purchases which are fueling the tremendous growth in work group networking within agencies throughout state government. As these networks grow and hold more agency electronic resources, they begin to vie for power and resources from the parent organization. Some of these networks are not initially known to the agency managers in charge of IT.

(2) During this study, various examples were identified of state government not acting on opportunities to leverage public resources to produce or secure cost-effective services on behalf of Missouri citizens. Among the most notable occurred in 1994. The Department of Highway and Transportation let a bid to a private company to lay fiber optic cable on the right-of-way of the interstate highway system in Missouri. (Allowing a private company to operate directly on the right-of-way of an interstate highway is extremely unusual and offers tremendous capital cost advantages to the company securing such access.) This cable is capable of carrying large volumes of voice, data and video signals at high speeds. (These are areas of critical importance to the State for current and future IT applications.)

During negotiations, the Department secured access on the cable for transmission of its own signals. However, the interest of the state, at large, in potentially securing access to this utility were not effectively represented in the negotiations with the successful contractor. Had state officials been more vigilant in recognizing the value of public resources being granted to a private company (the contract is for 40 years) and its ability to negotiate low cost access to a strategic utility, i.e., high speed data and video communications, a future cost avoidance worth millions of dollars may have been effected.

Another example is the recent legislation which authorized the Judiciary to collect an additional \$10 million in court fees to plan and implement a statewide automated court system. To appropriately plan for such an endeavor, there should be coordination among various agencies, such as the Attorney General, Department of Public Safety, Department of Social Services, etc. However, there is no assurance this planning and coordination will occur without a strategic IT planning process.

It is critical that statewide planning of IT resources be developed to prevent such occurrences in the future.

There is evidence of significant and costly duplication of various IT hardware and services in state government. One major area of expense is the operation of six separate state-funded mainframe computer centers within a three-mile radius of the Capitol Building in Jefferson City. (These include the Departments of Highway and Transportation, OA's State Data Center, Department of Labor and Industrial Relations (IT being recently reorganized from the Division of Employment Security), Department of Public Safety, Department of Social Services, and the Department of Elementary and Secondary Education.) Numerous studies in recent years have proposed consolidation of this capacity. However, there has been no movement to do so.

Another area of operation which has significant potential for savings or resource reallocation is that of the data communications network which is now in place for government agency use. There are dramatic levels of duplication in this contracted resource, owing largely to the lack of central management of the aggregate capacity thereof.

In the private sector, powerful workstations and PCs have rapidly replaced the large mainframe, but in state government, this transition is occurring much slower, is not centrally planned, and lacks standardization in approach, implementation, and support (see Table 2).

Similarly, connectivity among and within agencies with multi-platform networks (e.g., mainframe-to-midrange computers-to-PC networks, or any combination thereof) is generally quite limited due to incompatibility (refer to inventory in Table 3). State agencies are largely free to select among hundreds of proprietary and agency-developed computer programs to perform their operations. Particularly in the area of personal computing software (that which is experiencing the greatest installation growth - see Appendix C), state government subscribes to essentially few IT hardware or software standards, causing incongruities in IT implementation within and across agencies thus defeating interconnectivity efforts. There is much improvement needed to arrive at a statewide system where users, whether public or private and regardless of computing platform, can communicate and work effectively.

While standards for the selection of PC hardware and software are largely absent across state government, there are defacto standards in place for the mainframe environment (owing largely to there having in the past been one dominant vendor of mainframe hardware and software in Missouri state government). However, with the growing level of instability in the mainframe and mid-range industry, there may not be such market dominance by one company in the future and thus, standard setting will most likely, as in the case of PCs, LANs/WANs, and a wide variety of other IT areas, revert to the user.

There is no formal organization in place which has been given or has assumed the role of setting standards in such areas as networking, operating systems, EDI, computer assisted software engineering (CASE) tools, office applications such as word processing, e-mail, databases, spreadsheets, presentation graphics, and so forth. The Data Processing Managers, a voluntary association that meets regularly, has recently begun to function somewhat in this role. However, this group is not formally chartered and lacks authority to set or enforce statewide standards.

In summary, the results of this electronic isolation of agencies (i.e., "islands of information") causes continuing dependence on paper transfer of data, delays in communication among agencies, inability and/or inefficiencies in assembling critical data for decision making throughout government, which directly impact the cost, effectiveness and productivity of state government as a whole. State government should effectively leverage all of its resources to contribute to the service needs and competitive advantage of its citizens and private sector business partners.

Rationale

Governments must operate in an environment which presents new demands without additional resources. 'Doing more with less' is both a cliche and an imperative for governments in the 1990s. Productivity can substantially increase by rationalizing the delivery of services; computers provide the most cost effective way to rationalize service delivery currently available.

Fortunately, Missouri is comparatively well placed to take advantage of new technologies. The state will be required to make substantial investments in IT in the near future. The state currently spends less than 1% of its total budget (\$75 million), or about \$15 per year per Missouri citizen, on identifiable IT projects (see Appendices D and E). By planning now, the state can substantially improve productivity while avoiding costs inherent in continuing along the present course.

Possibly nowhere in state government is the need for meaningful coordination and planned expansion more evident than in the recent acquisition and use of PCs and small networks (see Tables 1 and 2). Since the first office PC was purchased in Missouri in the early 1980s, thousands of increasingly powerful machines have been acquired and placed into service. (According to the Office of Administration, there were approximately 22,000 PCs in the executive branch at the end of FY93.) Along with these computers have come important but expensive peripherals (i.e., large monitors, printers, modems, etc.), all of which add to the costs for purchase and maintenance, and which consume agency resources to house, operate and maintain.

The use of PCs is changing the way state business is done but the changes do not necessarily imply that business processes are being performed more efficiently or effectively. While state agencies have improved their capacity to generate paper documents, most still use PCs as "smart typewriters" and do not effectively use readily available databases, spreadsheets or other core business software. In order to effectively use current and future IT technologies, state agencies will be required to define their essential business activities and redesign their business processes.

Implementation

The recommended strategies have been successfully adopted in other states and currently have corollaries in Missouri state government. **The centerpiece of this recommendation requires the State of Missouri to develop an IT strategic planning process that addresses the needs of the State as a whole, the common needs of all state departments, and the individual needs of each. This activity should be followed with the development of IT plans which coordinate with the integrated strategic planning effort. In short, there must be a vision, a mission and values expressed by the organization, followed by specific goal-directed planning and effective implementation to realize the vision.**

Strategies - The following strategies are recommended for implementation:

1. *Implement an IT Strategic Planning Process which supports the statewide agency-specific strategic planning process.*

Appendix F includes the basic design and steps of a strategic planning process which are in conformance with the Organizational Planning Task Force's recommendations. In addition, the References section includes a variety of documents describing the efforts of other states in this area. This recommendation specifically calls for the development of a "process" which is ongoing and embedded in the current and future culture of state government. It should not be an "appendage" to current operations.

2. *Establish and Staff an Office of Information Technology (OIT), a.k.a. Chief Information Officer (CIO), Legislation to Revise Chapter 37, Section 37.005, RSMo., and Legislation to Revise Chapter 34, RSMo.*

The executive branch of state government currently has the statutory authority to control IT planning and coordination within itself; however, this control is not effectively exercised. This recommendation is to revise state statute and establish and clearly charge an organization with these control and planning functions, while leaving intact and separate the existing service functions (i.e., operation of State Data Center, programming services, telecommunications, microfilm production, office automation, microcomputer support) which are being effectively exercised. The following are critical collateral subrecommendations.

- a) Create an OIT and transfer the control and planning functions to this office. OA-DP&T would retain the service functions, while OIT would assume the coordination and control duties in the area of statewide IT. The Automation Task Force considered that the placement of this new office is critical to its effectiveness. Based on interviews, information collected, as well as experience of other states (see Appendix G), the Automation Task Force recommends that OIT be placed in the Governor's Office ⁽³⁾.

(3) The state agency data processing managers (Appendix H), as a group, have recommended placement of the office in OA per a report submitted by the managers dated July 8, 1994 (Appendix O).

Further, the relative standing of the Director of OIT to other cabinet-level officials is critical. It is recommended that the Director of OIT have parity with cabinet-level officials in state government.⁽⁴⁾

The following are other major features and functions conceived to be associated with OIT.

- The strategic plan supersedes the computing facilities and information plan developed by the Commissioner of OA. OIT will coordinate the creation and revision of a State IT Plan in conjunction with any statewide strategic planning efforts.
- Organize the development and administer the implementation of an IT strategic training program for all agency upper and mid-management IT professionals and support staff.
- Convene the IT Planning Board and IT Advisory Board (defined on page 15).
- Review all agency IT budgets and make recommendations to the Governor.
- Through the review of existing and emerging technology standards and issues, direct the statewide adoption of policy, procedures and standards, considering an open systems architecture. (See Appendices I and J for detailed narrative.)

(4) The compensation package for the director of this agency is very important to securing an individual who can successfully provide the required vision and direction. The Automation Task Force believes that an enhanced compensation package, possibly in excess of that provided current cabinet-level employees, will need to be provided in order to secure an individual with appropriate organizational talent and technical skill in this area.

- Promote and sponsor new technology research projects via a "technology laboratory" which, with agency participation, would conduct testing of various hardware and software products, examine different operating systems, and examine the latest in open systems technology. Also sponsored would be a "technology information center" which would contain technical information regarding IT and its implementation, and a periodic technology fair which would demonstrate new promising technologies, innovative IT projects of state government and private business.
- Work with the two boards associated with OIT to develop system performance measures, including common metrics, for evaluating the effectiveness of all major IT installations. These measures should be used as an indicator for IT utility rightsizing and/or consolidation.
- Survey the state of IT performance throughout state government considering the state's IT strategic plan; prepare and submit to the Governor an annual evaluation of IT performance with recommendations for change.
- Serve as a liaison to state and national groups.
- Regulate IT procurement to insure compliance with existing state and agency IT plans.

The Automation Task Force debated at length the initial difficulty of establishing the breadth of control which is needed for effective planning of IT statewide, particularly considering the current decentralized condition of IT decision making and resources. The Task Force recommends that the state initially secure the services of a contract employee to implement its recommendations. This recommendation results from the recognition that a period of instability and some tension will undoubtedly exist while priority and resources are being reordered and statewide planning is instituted. This is expected to be a very high-risk position in its initial years. Following this period of reordering, the state should consider reverting the directorship to an unclassified position. The staffing of this agency

should be from existing planning resources in OA-DP&T. Funding for the CIO and support of the technology laboratory associated with this agency could be secured from several sources.⁽⁵⁾

- b) Budget officials in each branch of government should direct their respective agencies and offices to accurately identify all IT expenditures in their annual budget documents and any interim budget requests (see Table 1).
- c) Given the technical nature of IT requests and the need for statewide coordination, all IT budget requests should be reviewed by one budget committee for each chamber. Corollaries to this process are the budget review procedures currently used for leases and capital improvements. An alternative would be to have all proposed IT expenditures captured in a single budget bill to be considered by the legislature.

(5) The following methods of generating revenue are recommended to be considered to fund various costs in OIT:

- a. Introduce a prorata increase of less than \$200,000 in the current fees paid for administration of statewide computing services (charging for the full costs of services of existing administrators of statewide computing services, including administrators of OA-DP&T, to user agencies and use the funds appropriated now for these salaries to fund OIT). Individual agencies should realize savings significantly beyond any additional costs.
- b. Develop fee-based value-added data services (e.g., sell or expand access to certain data not now provided outside repository agencies) which could be subscribed to by various private sector business partners. Use the residual receipts to fund this agency. (This should be done, regardless of the use of funds.)
- c. Contact philanthropic private business partners and seek financing for establishing and initially funding the IT agency.
- d. The technology laboratory could be equipped and operations funded through contributions from businesses which seek to do business with the State of Missouri. (There is a precedent for this arrangement in the OA-DP&T education center.) Procurement restrictions should be waived for purposes of securing IT which would be used only in the technology laboratory and for display and testing. The technology laboratory should be staffed by rotating loaned IT professionals from user agencies.

- d) OIT should be granted the authority to review IT budgets for all branches of state government and make recommendations to the Governor. Budget decision items would also be reviewed and recommendations made to the Governor. The authority for such may require an amendment to statute, Chapter 37, RSMo, Section 9 (see Appendix A). State agencies should not be constrained from acquiring appropriate IT resources which were not budgeted because of unanticipated service demands, so long as the proposed acquisition conforms to the strategic plan. The Automation Task Force questioned whether a contractor operating OIT could legally approve IT expenditures. This legal matter needs to be addressed if this tactical recommendation is pursued.
- e) State statutes which provide for procurement, specifically procurement of any IT-related services or items (emphasis on being broad in what may be included), should be reviewed and amended to give the authority for approval of procurement of IT to OIT and further, state officials who purchase IT without approval would be personally liable for such purchases and subject to prosecution (see Chapter 34.150). Procurement and budget authority over IT statewide would improve the effectiveness of OIT.

Proposed Revision to Chapter 34, RSMo.

"34.xxx The Commissioner of Administration (or OIT) shall approve all data processing and telecommunications procurement requests based on the computing facilities plan and information system plan referenced in Chapter 37.005(9)."

3. *Empanel an IT Planning Board⁽⁶⁾*

This recommendation calls for the recomposition and renaming of the Governor's Steering Committee on Information and Data Sharing. The purpose of this reconfigured board is to consider policy changes and actions, formulate the state's IT strategic plan, and work in partnership with the IT Advisory Board to implement the statewide IT strategies. The role of this board should be formalized and staffing should be provided from OIT. The Board would be chaired by the Director of OIT. In addition to high-level policy officials from each agency throughout all branches of state government being members of this board, a significant portion of membership should also be private sector business partners of state government, as well as consumers of state government services. The latter groups are critical to bring into consideration the effectiveness of state services to the business/consumer community.

4. *Empanel an IT Advisory Board*

This recommendation calls for the formal empaneling of an IT Advisory Board with the same composition as the existing Data Processing Managers Organization to set technical standards (see Appendix I for detailed discussion), select and sponsor new technology research and development activities (see Appendix J for detailed discussion), and conduct operational and tactical planning. Among the important duties of this board is to provide cohesive planning and communications among appropriate publics throughout state government, and to provide an arena for discussions relevant to the various IT groups including the LAN manager group, the CASE group and others. These are important subgroups whose thoughts and needs should be included in the central thinking regarding IT in state government. It is recommended that this Board be given the responsibility of providing an **open and objective** forum for investigation of any relevant technical issues.

(6) According to the Office of Administration's Annual Data Processing Plan (Fiscal Year 1993, p. 3), there are two organizations currently empaneled which could possibly be recomposed and empowered to provide functions of the technical planning and technical advisory boards which are called for in this plan. The current organizations are the Governor's Steering Committee on Information and Data Sharing (composed of policy level officials from each department - see Appendix K), and the Data Processing Managers Organization (IT directors from each agency - see Appendix H).

The role of this committee should be formalized and staffing should be provided through existing sources. The board would be chaired by the Director of OIT.

5. Heighten the Role of IT Throughout State Government

The Automation Task Force recognized throughout its deliberations that agencies reflected the importance they placed on IT in their business activities by where they positioned their agency's IT leader. It appeared to the Automation Task Force that agencies with IT leaders who, in recent years, had been placed in close proximity to the director of the agency, regardless of branch of government, were more progressive in their strategic uses of IT resources. Moreover, this repositioning was only one of numerous actions in such agencies to become more service focused. Similar observations were made in the organizational activities of agencies in other states and private enterprise.

The Automation Task Force recommends that agencies throughout all branches of state government review the positioning of IT leadership in their respective organizations and give strong consideration to upgrading the position held by the IT manager to one which would report to the director of the department or agency. The IT director position in agencies throughout state government is sometimes a merit or non-appointed position; in others the director is appointed by the agency executive. Agencies with non-appointed IT directors may consider any benefits which may be derived from changing the directorship to an appointed capacity. (See Table 1 for current positioning.)

Further, OA Division of Personnel, along with other directors of personnel offices in state agencies not part of the Merit System, should jointly review the job description for IT leaders and when necessary, revise the duties to reflect active leadership in IT planning and business process reengineering. Resource management should not be the sole or primary duty of IT directors; rather, they should also provide active leadership to promote coordination of IT with the central business activities of an organization. (This was not typically in the job description of IT leaders in state government.)

Timeline for Implementation - It is imperative that these recommendations be initiated as soon as possible.⁽⁷⁾ Specific target timeframes for these recommendations are identified herein. The following timeline is predicated on the state's fiscal year, being from July 1 through June 30. The budget development process for a fiscal year begins in the fall of the year prior to July 1 when it is implemented. At this time the agencies and OA, Division of Budget and Planning conduct the process of agency planning and review of budgets. The Governor's budget recommendations are finalized and sent to the legislature mid-January prior to the July when the budget appropriations bills will have been passed by the Legislature and signed into law by the Governor. This window of opportunity assumes actions can be taken in sufficient time for there to be positive effects on IT planning and budgeting during the 1996 Fiscal Year (July 1, 1995 - June 30, 1996). Suggested milestone activities are as follows:

September 1994

- Write RFB (Appendix L) for Director of OIT, or advertise for director.
- Revise prorata charge to agencies using statewide computing services to reflect all relevant salaries and equipment and expense costs associated with OIT. (Current data is available in the State Data Center Cost Allocation Plan.)
- Seek approval from House and Senate leadership to establish office and contract/hire director.
- Identify staffing for OIT and tentatively identify OA staff for reassignment.
- OA budget director to advise all agencies to clearly identify all IT expenditures in their budget documents. Budget officials in other branches of government to do likewise.

(7) There is a growing number of agencies or portions thereof which are using a proprietary product from Texas Instruments called Information Engineering Facility (IEF). It is a CASE tool which assists organizations in defining strategic business processes, where there are overlaps and inconsistencies in functions and applications, and which will generate application code for a variety of computing platforms, including a client-server environment. The broader application of this and other similar tools may offer considerable potential for easing agency-wide planning and IT development. It should be investigated further.

September-December 1994

- OIT director and staff organized. Agency initiates review of agency IT budgets.
- Draft proposed revisions to statute.
- Empanel the IT Planning Board and IT Advisory Board.
- Agencies directed to review IT leadership positions and reposition, as needed.

October 1994

- OIT, along with the IT Planning Board initiates efforts for statewide and agency-specific IT strategic planning
- Review and implement a mechanism in the legislature to consolidate IT budget requests.

December 1994

- Finalize budget reviews of agency IT requests and incorporate in the executive budget.

January 1995

- Introduce bills for statutory revisions recommended in this report.

Potential Costs and Savings - The recommendations contained herein, if combined with the revenue enhancing methods later described, will result in no additional appropriation requests. Combined with other recommendations from the Automation Task Force and other task forces relating to reengineering existing business processes to make more effective use of IT, these recommendations will provide substantial opportunities for redirection of resources and cost avoidance as a result of:

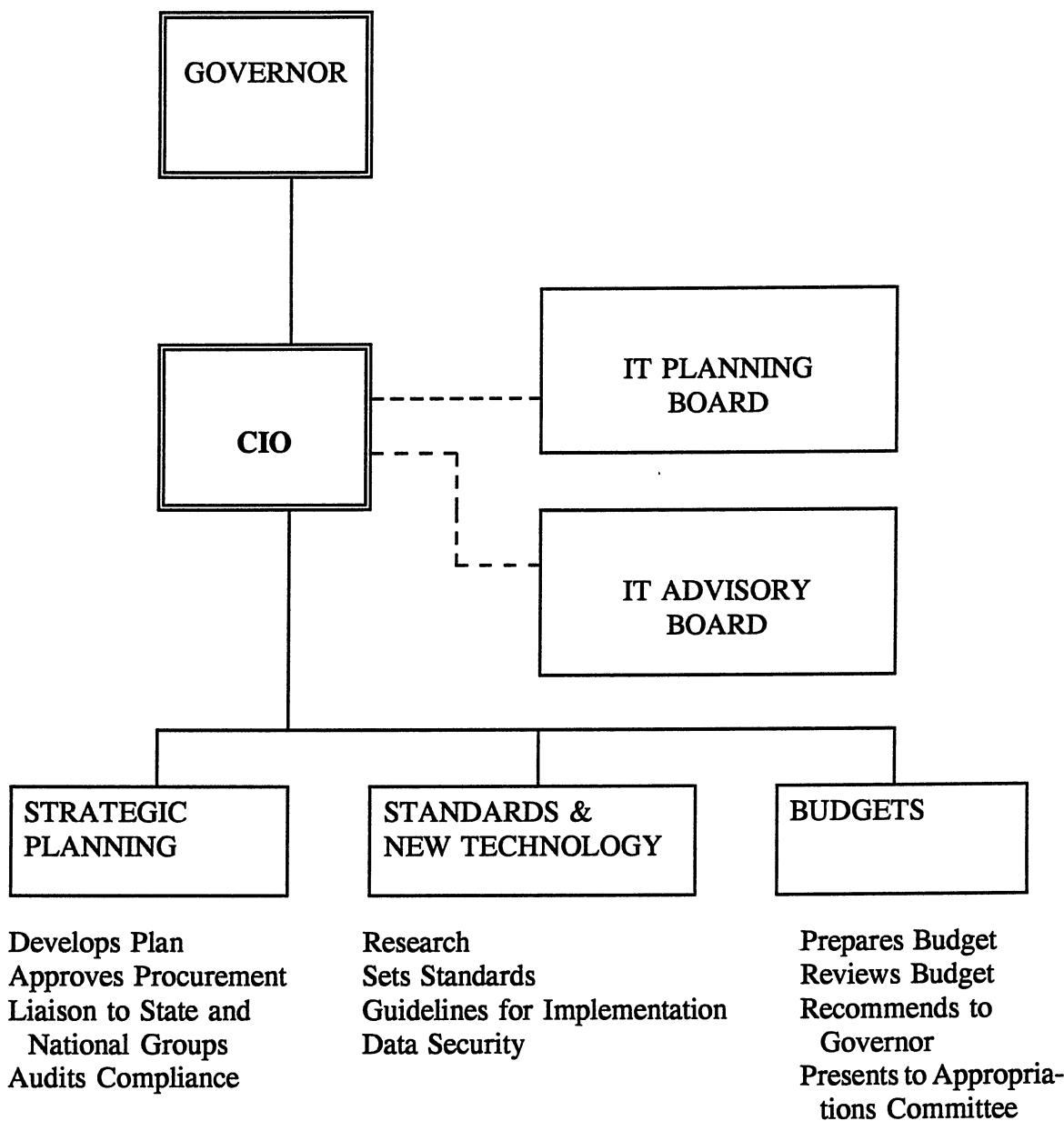
- there being a coherent purpose and direction integrating IT, and linking it to the central business processes of the state,
- reducing duplicated services,
- making more efficient use of current IT resources,

- better procurement decisions thus using financial resources more effectively,
- improved formulation of business processes which will provide business partners with efficiencies and opportunities currently not available, including the results of electronic data interchange (EDI),
- the development of a statewide program for agency administrators to enable them to effectively practice business reengineering efforts which make optimum use of IT resources, and
- other state institutions, i.e., colleges and universities, would have convenient and efficient electronic access to state information databases subject to administrative rules or statutes.

Moreover, they will likely result in substantial improvements in: a) claiming additional revenues from fees, licenses, ticket sales, taxes, etc. as a result of more complete, accurate and timely business processes; and b) tax revenues resulting from more effective interaction with private business partners, aiding them to be more productive and profitable, and reducing administrative burdens of reporting and receiving information.

Potential Barriers - Some agencies among the three branches of government report to commissions and boards; not directly to the Governor. This independence from the chief executive sometimes results in disputes between the Governor and the boards or commissions which are charged with determining the direction of such agencies. There is a need to establish rules of governance which will serve to bind the boards and commissions of such agencies into common action with other agencies comprising state government. Absent this, whenever an organization with considerable autonomy chooses, they may withdraw from cooperation and conduct IT activities similar to those now seen and which are resulting in some of the problems detailed in this report.

Organizational Chart/Functions of Chief Information Officer



Recommendation #2

Data Center Consolidation

Recommendation

Integrate state government mainframe computing resources.

Background

Since 1974, the Office of Administration (OA) has operated a large data center and offered computing resources to numerous state agencies which purchase computing services in lieu of owning their own mainframe computers. Other agencies have elected to purchase and operate their own mainframe computers. Currently, there are six independent mainframe data centers located in Jefferson City. These include data centers for the Office of Administration's State Data Center (SDC) which serves a number of executive branch departments, Department of Social Services (DSS), Department of Public Safety (DPS), Department of Highway and Transportation (DHT), Department of Labor and Industrial Relations (DLIR), and Department of Elementary and Secondary Education (DESE).

Three factors are common to the six data centers and make consideration of sharing resources important: a) all are based on essentially the same software technology; b) all plan to continue operating large mainframes for some time, and c) all report that expansion of capacity will be necessary in the future. In recent years, both public and private sector enterprises have successfully proceeded to consolidate multiple large computing operations to achieve economies of scale. (See Appendix M for background information.) The University of Missouri-Columbia currently has a project underway to consolidate three mainframe data centers into one.

With the exception of the SDC, the other mainframe data centers support departmental missions.⁽⁸⁾ These data centers are funded through their respective departmental budgets, except for the SDC which operates under a revolving fund.

Historically, there has been little incentive for departments to work cooperatively in the area of IT consolidation. Departments may be reluctant to give up their mainframe processors due to fear of losing control over the implementation and execution of applications. For this reason, it is recommended that the affected departments participate in the development of a plan that does not jeopardize their respective missions.

(8) The DSS provides mainframe computing to the Department of Health (DH). Formerly, DH was part of DSS, but is now a separate agency.

Rationale

Mainframe computing should be considered a utility, similar to telephone and electric service, which offers computing resources as its product. Private industry has embraced the practice of consolidating large computing resources as a means of procuring critical IT services at minimal cost. It is assumed that the state's objective is also to secure high quality computing resources at the lowest cost. Operating six independent data centers in Jefferson City does not achieve this objective; nor is it functionally necessary.

Consequently, it is recommended that the state move decisively to consolidate these data centers. This includes combining the mainframe hardware, software, system programmers, operators and support technicians. Departments should retain their application development staff and other specialized operations (i.e., local print capabilities, tape capabilities).

Consolidation is a complex project and requires careful planning. However, it has been accomplished successfully in many organizations. Research indicates that mainframe hardware, software, maintenance, utility, and personnel costs will be reduced, while performance and reliability will be improved. Additionally, increasing the scale of the data centers makes sophisticated automation tools more affordable, which can further reduce operating expenses. By reducing its mainframe data center costs, the state can redirect funds to address other critical IT needs.

Sharing computing resources has long term benefits for the state. Moving in this direction will force the reengineering of inefficient work processes, thus causing the state to provide the same or better level of service more efficiently. Future inter-departmental projects will be easier to implement once the departmental lines are softened by cooperative processing. Applications such as information kiosk, Missouri Card, and accessing the information superhighway will be facilitated by this infrastructure realignment. Management direction is the key to initiating this process of resource sharing.

Wisconsin, a state of comparable population to Missouri, achieved savings in excess of \$11 million in the first two years of its data center consolidation project. It was operating three large data centers and consolidated to one. Wisconsin was able to reduce the number of operations staff from 121 to 93 through reassignments and attrition.⁽⁹⁾

(9) For more information, contact Jon Stu Miller, Deputy Administrator of Info-Tech Services, Wisconsin State Government, (608) 266-7066.

Implementation

Data center consolidation is a major decision that requires management commitment, coordination, in-depth planning and a knowledgeable, professional staff. It is recommended that the data centers move toward consolidation through a two-phase internal effort designed as follows.

Phase I - The data centers should fully cooperate in acquiring common goods and services. These include mainframe hardware maintenance, software licenses, contractual support, and similar items. Since mainframe suppliers are faced with a shrinking market share, large buyers hold an advantageous position. The combined scale of the six data centers acting as a single buyer should result in sizable discounts. For example, group purchasing of hardware maintenance and software licenses is expected to result in a cost avoidance of \$527,600 annually (refer to calculations on page 27). This phase should be implemented as soon as possible. The savings from this phase would be used to fund the second phase of the project.

Phase II - To begin the second phase, departments with mainframe data centers should be directed to move toward consolidation through a joint planning process. This process should be under the direction of the Director of OIT. The planning group should be the IT Planning Board, in cooperation with the IT Advisory Board, which would determine the most appropriate consolidation solution, including the number of data centers ultimately required, center location(s), the management structure, disaster recovery considerations, and an implementation timetable.

It is recommended that there be a deadline established for a report from the IT Planning Board on the outcome of its review. This should be completed by January 1995 so that any resulting financial changes could be incorporated into the FY96 budget process.

Strategies - The following strategies are recommended for implementation:

1. Consolidate Three Small Mainframe Data Centers (HT, LIR and DESE).

These centers should purchase necessary mainframe service from OA, SDC. Based on current budgets, \$1,211,450 of current expenditures could be redirected (refer to calculations on page 28). Some expenses would be replaced by payments from these departments for computer services. Current SDC customers will experience a reduction in payments as a result of better utilization of these consolidated information resources (see table on page 28).

2. *Study Consolidation of Large Mainframe Centers.*

The DSS, DPS and OA data center operations should be reviewed for consolidation benefits. Since all have sizable and expanding operations, additional significant resource redirection will be realized by consolidating the larger data centers. Facilities will have to be studied to determine whether current space could be used or whether a different, suitably sized facility would be needed. Existing hardware and software resources should be optimized in any consolidation plan.

Any data center in the state providing processing service to another agency should develop service level agreements for the provision of such services. These agreements are intended to hold the provider of the service accountable for the response times, uptime and other criteria provided to customers. Cost recovery/chargeback processes must also be developed to support the provision of services. The SDC governance and charge back system are considered mature, and a model for any future consolidated systems.

Following physical consolidation, logical consolidation of applications should take place, as appropriate. Agency IT Strategic Plans should be used to realign business processes. Potentially some redundant administrative applications could be eliminated. Some strategic applications may be more effective if placed on different computing platforms, such as mid-range processors or microcomputers. Realigning applications will be time consuming, but will produce significant benefits to the state.

Timeline for Implementation - The proposed timeline assumes the complete cooperation of all data centers and the agreement that some combination of centers will be achieved. It also assumes that budget flexibility to redirect resources to other pressing IT challenges will be provided by OA as well as the legislature. Since data center consolidation is a major decision by state government and there appear to be substantial savings in a relatively short time, it is recommended that the process be started immediately, but no later than September 1, 1994, if possible.

September 1994 (begin Phase I - Cooperation on acquisition of goods and services by all data centers.)

- Establish a working group for cooperation on acquisitions consisting of representatives from each data center, the Division of Purchasing and OIT.
- Prepare a letter of intent and agreement for use in acquisition and joint operation of the working group on purchasing.

- Establish subgroups to specialize in areas of mutual initial agreement (including but not limited to hardware maintenance and software licenses) in order to effect savings immediately and allow funding for the beginning of Phase Two.
- Review all current contracts of all data centers establishing joint criteria and preparing notices necessary to vendors.
- Direct the budget officers of each agency which operates a data center to establish the future processes for identifying and reallocating funds.

It should be noted here that any area of mutual interest/concern which is now being addressed should be incorporated into Phase One of this effort.

October 1994

- Continue activities to assume savings through common purchasing.
- Present letter of intent to all involved agencies for approval and forward to Office of Governor, OA and the appropriate legislative offices.
- Continue work of subgroups and begin actual joint purchase of items selected in the initial process.

(Begin Phase II - Move toward Data Center consolidation through joint planning.)

- Establish in each agency an office to assist with the planning and implementation of the consolidation of the present data centers. This office should be at a level sufficient to allow easy access to the agency director and insure complete cooperation. All executive agencies should be involved in order to insure the development and progress of all departmental operations. Issues which involve legislative changes other than budget should be identified at this time and a working group established to draft changes.
- Direct departments to move toward consolidation.
- Assign the IT Planning Board as the planning group.

- Assign the IT Advisory Board responsibilities with the consolidation plan. It is imperative that this planning group complete its initial work in order to meet the implementation review deadline of February 1995, and to allow preparation of the budget.

December 1994

- Identify initial savings from purchasing consolidations and report to appropriate parties.
- Quantify savings to be accrued by consolidation and prepare additional financial recommendations for OA.
- Review legislative issues and follow with preparation of draft legislation, as necessary.

January 1995

- Present consolidation plan to Governor.
- Review funds for redirection from Phase One and determine redirection plan.
- Charge OIT with execution of the consolidation project. The consolidation plan should be finalized by approximately May 1995.

Potential Costs and Savings - Ideally, all mainframe operations would be performed in one physical and logical data center. Research studies show that the greatest efficiencies are received in data centers that would be the size of one consolidated Missouri state data center. Larger data centers can be run with proportionately fewer people. Various professional organizations which study such management structures provide estimates which indicate a consolidation effort in Missouri government would result in significant annual savings over current practices. Resources available for redirection have been estimated to be in excess of \$3,262,250 if all six data centers are consolidated (refer to calculations on page 28). ⁽¹⁰⁾

(10) This has been verified to be reasonable by an independent technology research firm, International Data Corporation, per verbal conversation with Frank Jens on April 20, 1994. This amount considers that there will be costs associated with the actual consolidation effort, primarily during the year in which the effort occurs.

Current Statewide Data Center Operating Costs

	OA	DSS	PS	HT	LIR	DESE	Total
Staff Positions	60	30	27	12	20	5	154
Salary and Benefits (\$)	2,088	1,214	912	564	636	163	5,577
Hardware (Ls/Purch) (\$)	1,020	1,800	936	0	0	75	3,831
Hardware Maintenance (\$)	720	504	228	104	136	36	1,728
Software Lease (\$)	1,524	0	516	0	0	62	2,102
Software Maintenance (\$)	624	960	228	336	510	26	2,684
Utilities (\$)	84	60	42	30	30	12	258
Space/Facilities (\$)	240	220	43	42	54	10	609
Total (\$)	6,360	4,788	2,932	1,088	1,386	389	16,943

Source: Department data center managers, June 1994.

Legend: OA = Office of Administration, DSS = Department of Social Services, PS = Department of Public Safety, HT = Department of Highways and Transportation, LIR = Department of Labor and Industrial Relations, DESE = Department of Elementary and Secondary Education.

Notes: a) All figures are annualized and expressed in \$000's.
b) All figures reflect current expenditures.
c) Utility costs were estimated.
d) Space was assumed to have a value of \$10 per square foot.
e) Personnel includes only system programmers, network staff, and computer operations.

The following calculations were used to derive the savings opportunities.

1. Purchase products/services cooperatively.
 - Hardware maintenance ($\$1,728,000 * 15\%$) $= \$ 259,200$
 - Software maintenance ($\$2,684,000 * 10\%$) $= \$ 268,400$
 - Total savings $= \$ 527,600$

2.	Consolidate three smallest data centers (HT, LIR and DESE)	
	Personnel (\$1,363,000 * 15%)	= \$ 204,450
	Hardware (\$276,000 * 75%)	= 207,000
	Software (\$872,000 * 75%)	= 654,000
	Utilities (\$72,000 * 85%)	= 61,200
	Space (\$106,000 * 80%)	= <u>84,800</u>
		= \$ 1,211,450
	Total Cost Avoidance	
3.	Consolidate all six data centers into one data center	
	Personnel (\$5,577,000 * 25%)	= \$ 1,394,250
	Hardware (\$1,728,000 * 40%)	= 691,200
	Software (\$2,684,000 * 40%)	= 1,073,600
	Utilities (\$258,000 * 40%)	= <u>103,200</u>
		\$ 3,262,250
	Total Cost Avoidance	
4.	Outsource mainframe computing	
	(\$16,967,000 * 30%)	= \$ 5,090,100

To tangibly reward consolidation, it is recommended that participating agencies be allowed to apply the resulting savings toward vital automation projects which have not been funded or have been underfunded. This approach would allow the state to take advantage of new technology without increasing expenditures. Among projects of greatest priority is providing appropriate disaster recovery services. Such services are critical for any organization which provides IT services. It is recommended that FTE which cannot be absorbed within an appropriately sized consolidation should be retrained and/or reduced through attrition.

The current data center management and staff are capable of achieving the savings identified herein. If however, the Governor finds the internal efforts toward consolidation to be ineffective, similar cost savings could be achieved by outsourcing data center operations. Savings under an outsourcing arrangement are estimated to be \$5,090,100 (as indicated above). According to the NASIRE report "Outsourcing Information Services in the Public Sector, January 1994", no state has totally outsourced data center operations. Specific functions, however, such as the processing of Medicaid claims and lotteries have been successfully outsourced in many states, including Missouri.

Recommendation #3

Data Network Consolidation

Recommendation

Consolidate the state telecommunication networks to improve management, planning, operation, and expansion of available functions.

Background

The data network maintained by Missouri state government consists of numerous independent, high speed communications networks, primarily dedicated to single state agencies, resulting in significant resource duplication and uncoordinated planning. Agencies typically design, install, operate, and expand their data networks with limited regard for sharing of equipment and communications bandwidth. The result of this infrastructure is a costly and ineffective statewide data network environment. (Refer to table on page 33 and Appendix N, Emerging Technology.)

Rationale

A high speed data and voice communications network is an essential element in the state's ability to provide expanding services while containing costs. While the existing voice network has largely accomplished this objective, the current independent data networking environment represents significant opportunities to:

- provide better services to the public,
- reduce duplication of current data network services and thereby, generate significant cost savings,
- provide an organizational structure to enable a coordinated focus on statewide data communication network planning,
- consolidate development of networking standards and research funding on evolving network communication technology products,
- provide immediate cost avoidance opportunities associated with reductions in current agency and departmental network enhancement and deployment initiatives; agencies included are the Departments of Revenue, Social Services, Elementary and Secondary Education, and Highway and Transportation, state courts, public schools, and public libraries.

- leverage the state's telecommunications staff expertise across departmental boundaries to expedite the deployment of tomorrow's communications infrastructure, and
- provide the ability to transition to modern, high-access applications (including interactive video) which will be otherwise impossible without a streamlined, efficient telecommunication environment.

Missouri government successfully manages its voice communications infrastructure across all agencies and departments through OA-DP&T. This organizational structure has led to an effective means of planning, installation, maintenance, contracting and management of voice communication services.

In contrast, data communication networks are left to the discretion of each agency. Only the purchase of network services and equipment is channeled through OA. This independent structure has led to an absence of actual bandwidth management, fragmented connectivity across state agencies, and duplicative services and associated costs.

An effective data communication network infrastructure is required to meet the expanding service needs of the state. Several other states have started the planning, development and installation of their communication systems and are positioning themselves to offer significant improvement in services to the citizens of their respective states. Missouri must address this issue quickly in order to develop the communications infrastructure required to enable high quality services in the future.

Implementation

Strategies - The following strategies are recommended for implementation:

1. Consolidate the Management of Voice/Data/Video Communication Services into OA

The communication environment of the future will require the "merger" of voice, data and video services into a single network architecture. New application software already utilizes all of these communication modalities into a single workstation environment. A single, consolidated departmental structure needs to establish a management structure which promotes the coordinated planning, design, implementation and support of a state wide voice, data and video network.

The Automation Task Force discussed the relative merits of contract bandwidth management versus state management. Given the relative complexity and rapid evolution in this area, it is recommended that these options be studied further in order to select an appropriate management strategy.

2. *Consolidate Agency Network Staffing into OA*

Significant data network staff and equipment resources are spread across state agencies (see table on page 33). Consolidation of these staff and network equipment assets into a single network communications section in OA could enhance network planning, installation and support issues while insuring coordination of all network communication activities.

Those departments headed by boards or commissions that have considerable constitutional autonomy should be encouraged to cooperate with OA to better meet their own networking needs while improving the cost effectiveness of state government. The success of these departments in utilizing the state telephone system managed by OA should serve as a model for other joint telecommunications ventures.

3. *Develop a Statewide Network Communications Plan*

This plan should forecast requirements for a three-year horizon, assess the architecture needed to support the state's communications infrastructure for the next ten years, and identify immediate cost savings opportunities associated with statewide network consolidation. This planning process should examine the comparative costs of lease versus purchase of key components of the state's telecommunications infrastructure. Based upon departmental interviews, the Network Communications Plan should be developed jointly by OIT, IT Planning Board, IT Advisory Board, and OA and made available to all agency heads for review and comment. It is recommended that the plan be completed by December 1994.

4. *Develop Technology Standards Related to Network Communications*

In coordination with OIT, IT Planning Board, and IT Advisory Board, OA should participate in the creation of statewide voice, data and video network communication standards. Such standards should identify products and services (including network protocols, software and equipment) which will be used to develop a single statewide communications access system. These standards will also define the suite of network products to be supported by OA-DP&T. Representation from higher education institutions is critical in this process. It is recommended that an initial set of network standards be

developed by December 1994, in concert with the development of the Network Communications Plan.

5. *OA Should Develop Service Level Agreements Which Outline Expectations for User Voice, Data and Video Network Services*

As the prime network services provider to state agencies, OA must proactively develop user service level agreements which document standards pertaining to network services. Developed with departmental user input, these service level agreements should provide users with a set of expectations for holding OA accountable for centralized network services.

Agency cost recovery/chargeback processes should be developed to support the consolidation of telecommunication services into OA-DP&T. As a result of the consolidation of all telecommunication staff and equipment resources into OA-DP&T all primary voice, data and video communication expenditures should be presented as a component of OA-DP&T annual budget package. Similar to the existing voice communications environment, however, an agency cost recovery/chargeback process should be developed related to OA-DP&T's management and support of all telecommunications services. The chargeback process should focus on cost recovery (no mark-up) for total network services rendered and be directed at the state agency receiving those services.

Timeline for Implementation - It is imperative that these recommendations be initiated as soon as possible.

September-December 1994

- Based upon departmental interviews, develop a Statewide Network Communications Plan.
- Develop an initial set of network standards.

Potential Costs and Savings - Consolidation of the numerous independent networks will reduce duplication of services and result in an annual savings over current practices. Resources available for redirection have been estimated to be \$765,000 if all major networks and support are consolidated. This estimate does not include several new networking initiatives yet to be completed. It is again recommended that FTE which cannot be absorbed within consolidation be retained and/or reduced through attrition.

Network Communications Current Operating Costs

Agency	Salary	Benefits	Equipment	Other	Circuits/Serv	Total
Lottery (\$)	24	10	6	2	2,726	2,768
Social Services (\$)	304	132	227	30	619	1,312
Labor & Industrial Relations (\$)	346	138	65	35	257	841
MOREnet (\$)	120	48	232	12	160	572
Office of Administration (\$)	83	24	156	8	292	563
Highway Patrol (\$)	230	92	86	23	108	539
Corrections (\$)	50	20	78	5	235	388
Revenue (\$)	42	17	24	4	176	263
Mental Health (\$)	35	14	37	4	135	225
Highway & Transportation (\$)	48	19	7	5	97	176
TOTAL (\$)	1,282	514	918	128	4,805	7,647
10 % SAVINGS (\$)	128	51	92	13	481	765

Source: June 1994 Survey of Agencies.

Notes: "Other" column comprises personnel expense and equipment costs.

- All figures are annualized and expressed in \$000s.
- MOREnet is an acronym for Missouri Research and Education Network.

Appendices

A. Chapter 37, Section 37.005, RSMo.

Existing:

Revised Statutes of the State of Missouri 1988

9. The Commissioner of Administration is hereby authorized to coordinate and control the acquisition and use of Electronic Data Processing (EDP) and Automatic Data Processing (ADP) in the executive branch of state government. For this purpose, the Office of Administration will have authority to:

- (1) Develop and implement a long-range computer facilities plan for the use of EDP and ADP in Missouri state government. Such plan may cover, but is not limited to, operational standards, standards for the establishment, function, and management of service centers, coordination of the data processing education, and planning standards for application development and implementation;
- (2) Approve all additions and deletions of EDP and ADP hardware, software, support services, and service centers;
- (3) Establish standards for the development of annual data processing application plans for each of the service centers. These standards shall include review of post-implementation audits. These annual plans shall be on file in the Office of Administration and shall be the basis for equipment approval requests;
- (4) Review of all state EDP and ADP applications to assure conformance with the state information systems plan, and the information systems plans of state agencies and service centers;
- (5) Establish procurement procedures for EDP and ADP hardware, software, and support service;
- (6) Establish a charging system to be used by all service centers when performing work for any agency;
- (7) Establish procedures for the receipt of service center charges and payments for operation of the service centers. The Commissioner shall maintain a complete inventory of all state-owned or -leased EDP and ADP equipment, and annually submit a report to the General Assembly which shall include starting and ending EDP and ADP costs for the fiscal year previously ended, and the reasons for major increases or variances between starting and ending costs. The Commissioner shall also adopt, after public hearing, rules and regulations designed to protect the rights of privacy of the citizens of this state and the confidentiality of information contained in computer tapes or other storage devices to the maximum extent possible consistent with the efficient operation of the Office of Administration and contracting state agencies.

Proposed:

9. The Commissioner of Administration is hereby authorized to coordinate and control the acquisition and use of ~~Electronic Data Processing (EDP)~~ and ~~Telecommunications DP&T~~ ~~Automatic Data Processing (ADP)~~ in the executive branch of state government. For this purpose, the Office of Administration will have authority to:

- (1) Develop and implement a long-range computer facilities plan for the use of ~~Data Processing and Telecommunications EDP and ADP~~ in Missouri state government. Such plan may cover, but is not limited to, operational standards, standards for the establishment, function, and management of service centers, coordination of the data processing education, and planning standards for application development and implementation;

A. Chapter 37, Section 37.005, RSMo. (Continued)

- (2) Approve all additions and deletions of ~~Data Processing and Telecommunications EDP and ADP~~ hardware, software, support services, and service centers;
- (3) Establish standards for the development of annual data processing application plans for each of the service centers. These standards shall include review of post-implementation audits. These annual plans shall be on file in the Office of Administration and shall be the basis for equipment approval requests;
- (4) Review of all state ~~Data Processing and Telecommunications EDP and ADP~~ applications to assure conformance with the state information systems plan, and the information systems plans of state agencies and service centers;
- (5) Establish procurement procedures for ~~Data Processing and Telecommunications EDP and ADP~~ hardware, software, and support service;
- (6) Establish a charging system to be used by all service centers when performing work for any agency;
- (7) Establish procedures for the receipt of service center charges and payments for operation of the service centers. The Commissioner shall maintain a complete inventory of all state-owned or -leased ~~Data Processing and Telecommunications EDP and ADP~~ equipment, and annually submit a report to the General Assembly which shall include starting and ending ~~Data Processing and Telecommunications EDP and ADP~~ costs for the fiscal year previously ended, and the reasons for major increases or variances between starting and ending costs. The Commissioner shall also adopt, after public hearing, rules and regulations designed to protect the rights of privacy of the citizens of this state and the confidentiality of information contained in computer tapes or other storage devices to the maximum extent possible consistent with the efficient operation of the Office of Administration and contracting state agencies.
- (8) Review ~~Data Processing and Telecommunications~~ budgets and new budget requests and make recommendations to the Governor.

B. Notes from Annual Data Processing and Telecommunications Report and Plan, Fiscal Year 1993, Missouri Office of Administration.

The following are summary notes from this source.

1. The offices of elected officials have a wide variety of basic IT hardware and software. However, due to the composite of such often being incompatible, there is little ability to communicate within and across the offices of such officials. Some equipment is quite dated in architecture and functionality.
2. There are approximately 22,000 PCs in the executive branch.
3. The Governor's Steering Committee on Information and Data Sharing (comprised of policy level officials from each department) is to operate in a policy advisement role. It has formed four subcommittees: networking, global card uses, kiosk system uses, and management of state information through technology.
4. There is a wide variety of PC-based office automation software used throughout state government. There are no standard packages recommended by the Office of Administration. (Includes word processing, database, spreadsheet, e-mail, and so forth.)
5. Almost all executive branch agencies referred to LANs in either having them operational or planning such. There are several references to isolated wide area networks (WANs).
6. Not all agencies have disaster recovery plans.
7. Numerous agencies referred to having begun using the Texas Instruments tool, Information Engineering Facility (IEF), for strategic planning and as a case tool at various levels of their departments. It appears that IEF has been accepted by some as a standard.
8. Rarely in the report is there any reference to the need for training of staff on how to use IT tools, and there is no reference to administrators needing training how to incorporate the use of IT in business process engineering.
9. Elected officials referred in text to having assigned IT duties to specific staff; however, personnel expenditures for IT managers could not be identified. These data are of little use for planning and budgeting and further reflect on the need for accuracy in reporting data about IT throughout state government.

**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994**

1. Significant Conclusions of LAN Survey:

(missing Corrections, Econ Dev, Health, Higher Ed, DNR, most political offices, University of Missouri and miscellaneous other colleges)

There were 20,000 microcomputers as of June 30, 1993, according to OA-DP&T Annual Data Processing and Telecommunications Report and Plan.

Survey respondents showed 86.5 % microcomputers networked.

FY94 estimated invested value in microcomputers and LANs: \$ 36.9 million.

Expected FY95-96 LAN expenditures: \$ 63.2 million.

Growth rate of microcomputers/LAN over last 5 years:
10 - 3000 % (some have been established from start with PCs).
Most are in range of 300 - 600 %.

Expected growth of LAN for next 2 years:
0 - 2500 % (only one agency expects to stay on AS/400).
Most of growth is 20-30 % range.

Expected use of microcomputers in daily work:
25 - 100 % of all department workers. Some lower values have high levels of employees performing manual tasks. Majority of agencies expected 80 % or greater to need microcomputers in daily work in the future.

Expected Advantages of: data sharing, flexibility, increased productivity, scalability, communications, E-mail, etc.

Expected Disadvantages of: costs, management, user training, lack of standards, increased need for support personnel.

Significant cost savings and indirect benefits difficult to measure. LAN and PCs do NOT necessarily cost less. Benefits difficult to measure such as increased productivity, efficiency, greater flexibility are present.

**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

Establishing training for a statewide basis of advanced or certification of network operating systems would have little benefit since most agencies favor specialized emphasis of their own environment. Beginning or introductory level training may reach levels where some common training might be cost effective.

2. Lack of Networking Leadership and Coordination.

Resulting in Duplication of effort/costs.

Expect Data Network Consolidation to address these needs.

3. Improvement in Purchasing issues.

Know that another task force is looking at this issue, but that it has important impact on networking. Dynamic market with changing technology MUST be responsive to those directly working on networking issues to implement cost-effective solutions.

4. Other Specific Issues.

Two other areas related to multi-protocol WANs through Frame Relay telecommunications and network address standardization.

**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

AGENCY	Connected to LAN	Pentium	486	386	286	8088	MAC	Total
Agriculture	51			25	26			51
Auditor	60		27	54	32	26		139
Conservation	400		243	287	77		17	624
Elementary & Secondary Education	335		100		235			335
Employment Security	417		378	38	1			417
Highway & Transportation	2,050		1,000	750	300			2,050
Highway Patrol	210		188	16	1	5		210
Insurance	125		180					180
Mental Health	1,200		671	466	201			1,338
Office of Administration	416		416	170				586
Public Safety	200		200					200
Revenue	176		58	26	57	35		176
Senate	32		32	30	9	30		101
Social Services	200		100	50	40		10	200
Lottery	112	2	103				9	112
TOTALS	5,984	2	3,696	1,912	979	96	36	6,719
MO Western State College	160		20	170	130	150	255	725
MO Southern State College			200				20	220
Northwest MO State College	200		75	75			50	200

**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

AGENCY	Current Invested Value	Estimated Budgeted FY95/96	Applications
Agriculture	25,000	50,000	Word processing, spreadsheet
Auditor	300,000	150,000	Word processing, spreadsheet, accounting, audit, e-mail, calendar
Conservation	2,775,000	1,000,000	
Elementary & Secondary Education	250,000	250,000	Word processing, spreadsheet, database, imaging
Employment Security	2,819,000	200,000	Image, word processing, spreadsheet, database, bulletin board
Highway & Transportation	20,000,000	10,000,000	Drafting, GIS, word processing, spreadsheet, database
Highway Patrol	840,000	800,000	Image, word processing, database, wireless communication
Insurance	1,424,800	200,000	Word processing, spreadsheet, database, host emulation, e-mail, calendar
Mental Health	3,700,000	675,000	Word processing, spreadsheet, presentation, e-mail, calendar
Office of Administration	1,713,200	366,000	Word processing, spreadsheet, e-mail, office systems, image
Public Safety	1,400,000	150,000	Word processing, spreadsheet, database, desktop publishing
Revenue	312,000	180,000	Word processing, spreadsheet, database, desktop publishing
Senate	135,000		Secretarial work, bill drafting/research
Social Services	800,000	49,000,000	FAMIS, MACSS, e-mail, word processing, spreadsheet, image
Lottery	195,000	160,000	Word processing, spreadsheet, e-mail, communication, calendar, scheduling
TOTALS	36,689,000	63,181,000	
MO Western State Col.		340,000	
MO Southern State Col.	500,000	130,000	
Northwest MO State Col.	1,000,000	100,000	

**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

AGENCY	Estimated Growth Over Last 5 Years	Estimated Growth Over Next 2 Years	Percent Needing PCs in Job Next 2 Years
Agriculture	300		75
Auditor	300	33	100
Conservation	750	20	85
Elementary & Secondary Education		10	100
Employment Security	3,000	30	80
Highway & Transportation	600	70	80
Highway Patrol	1,200	200	25
Insurance	400	10	100
Mental Health	3,000	25	30
Office of Administration	143		90
Public Safety	400	25	80
Revenue	75	30	70
Senate	20	30	95
Social Services	150	2,500	60
Lottery	10	5	67
TOTALS	10,348	2,988	1,137
MO Western State College	180	200	90
MO Southern State College	200	100	50
Northwest MO State College	100	20	100

**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

AGENCY	Advantages	Cost Savings?
Agriculture	Daily tasks	-1,900
Auditor	Productivity, job performance, efficient communication	
Conservation	Shared information	3,000
Elementary & Secondary Education	Connectivity, productivity	N/A
Employment Security		
Highway & Transportation	Scalability, effective	Significant
Highway Patrol	End users	None, Increase
Insurance	Productivity	Indirect
Mental Health	Data sharing, communication	250,000
Office of Administration	Flexible emulation, job variety, data access	Best choice for job
Public Safety	Flexibility, availability, use, economy	5 - S/36 replaced
Revenue	Data share, standards	No definite
Senate	Self control prestige	None
Social Services	Data availability, sharing	In broad sense
Lottery	E-mail, communications	
TOTALS		251,100
MO Western State College	E-mail, sharing, info retrieval, productivity	Efficiency, productivity
MO Southern State College	Upgrades easier	No
Northwest MO State College	Communication	Efficiency, effectiveness

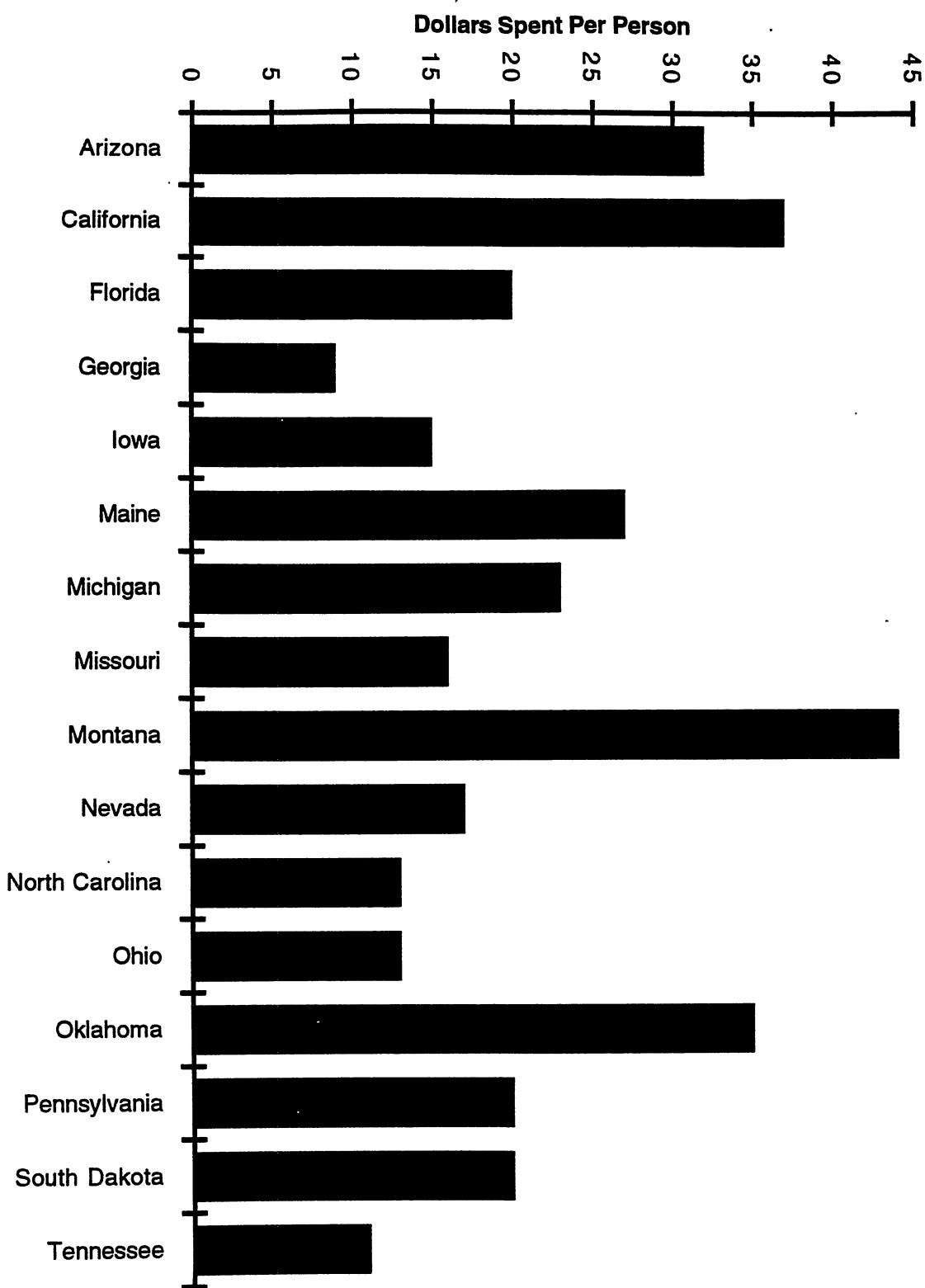
**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

AGENCY	Disadvantages
Agriculture	Backups
Auditor	
Conservation	Remote administration
Elementary & Secondary Education	Cost, inventory management, integration, standards, expertise
Employment Security	
Highway & Transportation	Management tools not mature
Highway Patrol	Support
Insurance	User education
Mental Health	Labor intensive maintenance, costly upkeep
Office of Administration	Equipment cost, user training, software, conflicts, standards
Public Safety	LAN care/support
Revenue	
Senate	Cost, standards, lack of experience
Social Services	Administrative efforts
Lottery	Administration
MO Western State College	Cost, training
MO Southern State College	Support
Northwest MO State College	Cost maintenance

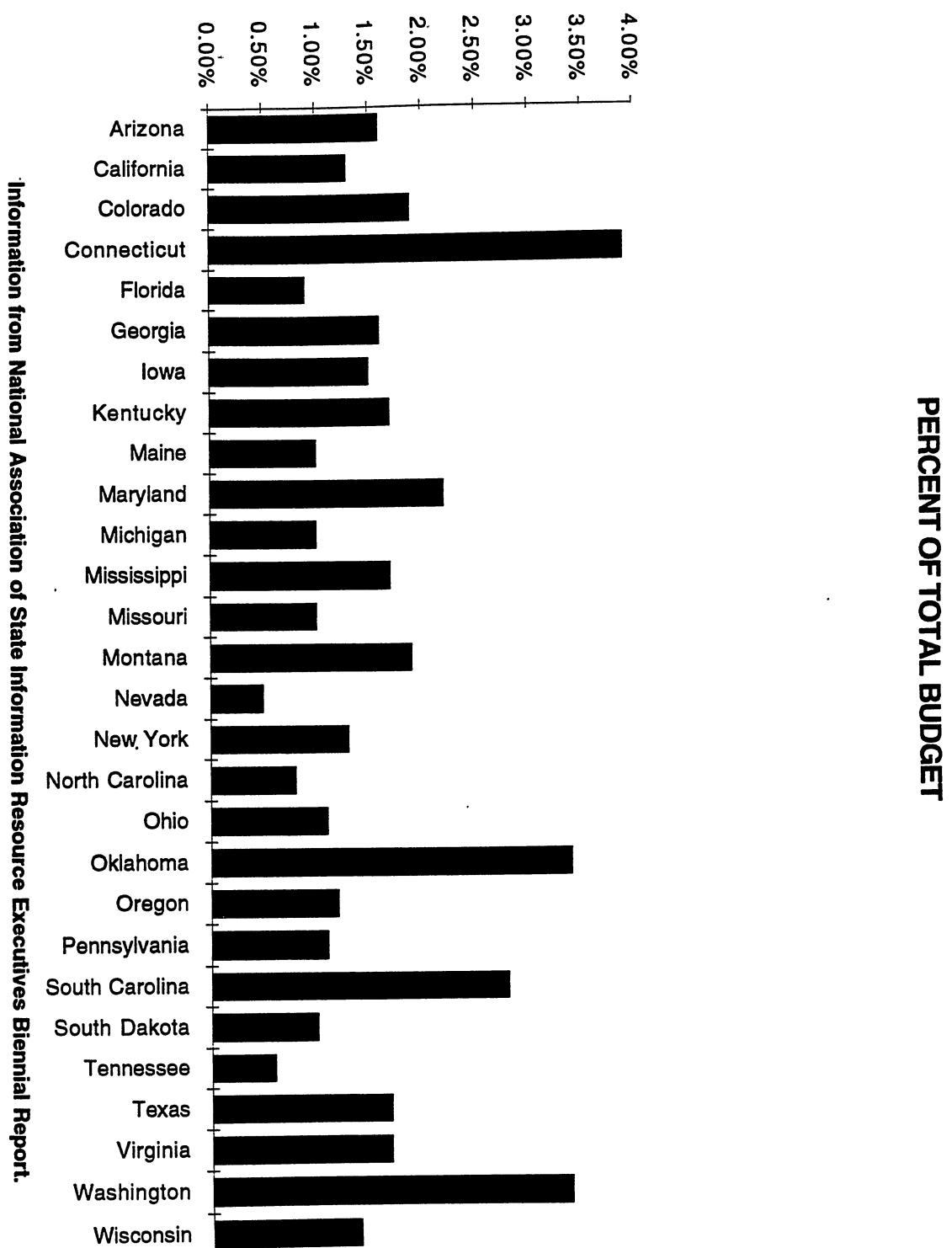
**C. LAN Users Group Presentation Before COMAP Automation Task Force,
June 17, 1994 (Continued)**

AGENCY	How LAN/WAN Administered	Relationship LAN Mgt. to Traditional DP	Education Certification	Statewide Training Needs
Agriculture	1 DP staff	DP only	Self taught	3-5
Auditor	Professional LAN Administrator	LANs only	Some	0
Conservation	Specialist, Central division	Diverse	DP trainer	6-8
Elementary & Secondary Education	LAN Administrator	Section	CNE	2
Employment Security	In sections/EDP		CNE	0
Highway & Transportation	Section/EDP	Design	1	20
Highway Patrol		Central EDP	Operator/LA	0
Insurance	LAN Administrator	Central DP	Planned	0
Mental Health	Central EDP	Central DP	None	20 - 25
Office of Administration	Division Coordinator	Cooperative	None	2
Public Safety	Lead Individual	Central	None	3 - 6
Revenue	Division coordinator	End user	EUC	5
Senate	Central DP	Central DP	CNE	6
Social Services	Divisionally	Central	5 IBM	50 beginning, 5 intermediate
Lottery	Central	Central	Novell	5-10 beginning, 2-4 intermediate, 1-2 certified
MO Western State College	Department	Central (WAN)	Novell	Some
MO Southern State College	Central	Central		6 - 10
Northwest MO State College	Central	Central	BS/MS	1 certified

D. IT Expenditures per Citizen by State



E. IT Expenditures as a Percent of State Budgets



Information from National Association of State Information Resource Executives Biennial Report.

F. Essential Elements of An IT Strategic Planning Model

Participants in contemporary strategic planning must possess a conceptual understanding of the capacity of information technology to impact the design and productivity of business processes. For many business processes, IT may be a more significant resource to productivity than the human resources which have been or could be involved. **This reality is counter to the traditional thinking that greater productivity is always associated with more person hours on task, and will require planners and administrators to set aside some traditional assumptions about program administration.** This may necessitate retraining of some or many administrators in organizations.

Planning Steps

1. Recognize and be prepared to accommodate and support the culture requirements for effective organizational planning and the inevitable mandate for change to current business processes.
2. Determine organization mandates and requirements. Reevaluate assumptions, old or new. IT planning should conceive its mandate to be to support those contained in the State's strategic plan.
3. Arrive at the organization's mission, values and the need to develop and maintain a vision of the organization in relation to its publics, mandates and opportunities.
4. Considering the organization's vision, values and mission, determine the strategic issues which concern and affect the organization. Reevaluate assumptions, old or new.
5. Establish organization goals, objectives, strategies and action plans. Link the business needs with existing support capacity and differentiate among available and needed services, available and unneeded services, available services which are needed but require change, new services which need to be secured.
6. Determine a realistic evaluation process and performance measures.
7. Derive a resource acquisition program to provide the capacity needed to address the strategic plan.
8. Business perspectives from the users of the information.

F. Essential Elements of An IT Strategic Planning Model (Continued)

As in many other businesses, the skill sets of employees must change over time. This is especially true for persons who work in IT. Organizations which fail to plan for and support the changing skill set of IT professionals will have a corresponding effect on their productivity and competitiveness, and that of their parent organizations.

Table 9. CIO Organizational Relationships

States With CIO	Chief Information Officer (CIO) Title, Division	CIO reports to:	CIO relationship to commission
Group 1	Delaware	Executive Director, Office of Information Systems	Budget Director, Office of the Budget, Executive Department
	Idaho	Statewide Data Processing Coordinator, Information Resource Management	Director, Department of Administration
	Maine	Director, Bureau of Information Services	Commissioner, Administrative and Financial Services
	Montana	Administrator, Information Services Division	Director, Department of Administration
	Nevada	Director, Department of Data Processing	Governor
	New Mexico	Director, Information Systems Division	Cabinet Secretary, General Services Department, Office of the Secretary
	North Dakota	Director, Information Systems Division	Director, Office of Management and Budget
Group 2	South Dakota	Director, Information Systems	Bureau of Administration, Executive Management
	Arizona	Assistant Director, Data Management Division	Director, Department of Administration
	Arkansas	Director, Department of Computer Services	Governor
	Colorado	Staff Director, Commission on Information Management	Executive Director, Department of Administration
	Kansas	Director, Division of Information Systems & Communication	Secretary, Department of Administration
	Kentucky	Commissioner, Department of Information Systems	Secretary, Finance and Administration Cabinet
	Mississippi	Executive Director, Central Data Processing Authority	Central Data Processing Authority Board
	Oregon	Administrator, Information Systems Division	Director, Executive Department
	South Carolina	Deputy Director, Office of Information Technology Policy & Management	Agency Director, Budget & Control Board, Research and Statistical Services
Group 3	Alabama	Director, Data Systems Management Division (pending)	Finance Director, Department of Finance
	Maryland	Assistant Commissioner, Information Policy Office	Secretary, Budget and Fiscal Planning
	Minnesota	Chief of Information Systems	Commissioner, Department of Administration
	Tennessee	Director, Department of Information Services	Commissioner, Department of Finance and Administration
	Washington	Division Administrator	Governor, Office of the Governor
	Wisconsin		Secretary, Department of Administration
Group 4	California	Director, Office of Information Technology	Director, Department of Finance
	Florida	Executive Administrator, Information Resource Commission	Governor and Cabinet
	Illinois	Director, Department of Central Management Services	Governor
	North Carolina	Deputy State Controller for IRM, Office of the State Controller	State Controller, Office of the State Controller
	Ohio	Deputy Director, Division of Computer and Information System Services	Director, Department of Administrative Services
	Pennsylvania	Special Assistant to the Governor for Computer Information Systems	Deputy Chief-of-Staff for Operations & Administration, Governor's Office
	Texas	Executive Director, Department of Information Resources	N/A
	Virginia (1)	Director, Department of Information Technology	Both the director of DIT and the staff director of CIM are appointed by the Governor and report to the Secretary of Administration.
	(2)	Staff Director, Council on Information Management	For DIT director, commission advises CIO For CIM director, reports to someone else, but accountable to commission

G. Chief Information Officer Comparisons (Continued)

Table 10. Government Structures Under CIO Authority

Chief Information Officer (CIO)																			
States With CIO	Same Authority as Commission	Executive Department	Sets/Approves IRM	Legislative Branch	Sets/Approves IRM	Judicial Branch	Sets/Approves IRM	University System	Sets/Approves IRM	Community College System	Sets/Approves IRM	Public Schools	Sets/Approves IRM	County Governments	Sets/Approves IRM	Municipal Governments	Sets/Approves IRM	Public Net-Work	Sets/Approves IRM
Group 1	Delaware	no	full	part ¹	part	stan	part	part	part	pol/stan	full	full	part	none	none	none	none	none	
	Idaho	same	full	part	part	stan	none	none	none	pol/stan	full	none	none	none	none	none	none	none	
	Maine	no	full	part	part	stan	part	part	part	pol/stan	full	none	part	none	none	none	none	none	
	Montana	no	full	part	part	stan	none	part	none	pol/stan	full	none	one	none	none	none	none	none	
	Nevada	no	full	part	part	stan	part	part	part	pol/stan	full	none	none	part	none	none	none	none	
	New Mexico	no	full	part	part	stan	none	part	none	pol/stan	full	none	one	none	none	none	none	none	
	North Dakota	no	full	part	part	stan	part	part	part	pol/stan	full	none	none	part	none	none	none	none	
Group 2	South Dakota	no	full	part	part	stan	part	part	part	pol/stan	full	none	none	none	none	none	none	none	
	Arizona	no	none	full	full	pol/stan, pol/stan	none	none	none	pol/stan	none	part	none	none	none	none	none	none	
	Arkansas	no	same	full	full	pol/stan, pol/stan	full	none	full	pol	part	none	none	none	none	none	none	none	
	Colorado	no	same	full	full	pol/stan, pol/stan	none	none	none	pol	part	none	none	none	none	none	none	none	
	Kansas	no	same	full	full	pol/stan, pol/stan	none	none	none	pol	none	none	none	none	none	none	none	none	
	Kentucky	no	same	full	full	pol/stan, pol/stan	none	none	none	pol	none	none	none	none	none	none	none	none	
	Mississippi	no	same	full	full	pol/stan, pol/stan	none	none	none	pol	full	full	part	part	part	part	part	part	
Group 3	Oregon	no	full	full	full	pol/stan, pol/stan	none	none	full	pol	none	none	none	none	none	none	none	none	
	South Carolina	no	full	full	full	pol/stan, pol/stan	none	none	full	pol	part	none	none	none	none	none	none	none	
	Alabama	no	full	part	full	pol/stan, pol/stan	part	part	part	pol/stan	none	part	part	part	none	none	none	none	
	Maryland	no	full	part	full	pol/stan, pol/stan	none	none	none	pol	part	none	none	none	none	none	none	none	
	Minnesota	no	full	part	full	pol/stan, pol/stan	part	part	part	pol	part	none	none	none	none	none	none	none	
	Tennessee	no	full	part	full	pol/stan, pol/stan	part	part	part	pol	part	none	none	none	none	none	none	none	
	Washington	no	full	full	full	pol/stan, pol/stan	full	full	full	pol	full	full	full	full	full	full	full	full	
Group 4	Wisconsin	no	full	full	full	pol/stan, pol/stan	full	full	full	pol	none	none	none	none	none	none	none	none	
	California	no	same	part	full	pol/stan, pol/stan	none	none	none	pol	part	none	none	none	none	none	none	none	
	Florida	no	same	full	full	pol/stan, pol/stan	none	none	none	pol	none	none	none	none	none	none	none	none	
	Illinois	no	same	full	part	pol/stan, pol/stan	none	none	none	pol	none	none	none	none	none	none	none	none	
	North Carolina	no	same	full	part	pol/stan, pol/stan	none	none	none	pol	part	none	none	none	none	none	none	none	
	Ohio	no	same	full	part	pol/stan, pol/stan	none	none	none	pol	none	none	none	none	none	none	none	none	
	Pennsylvania	no	same	full	part	pol/stan, pol/stan	none	none	none	pol	part	none	none	none	none	none	none	none	
Group 4	Texas	no	same	full	part	pol/stan, pol/stan	part	part	part	pol	part	none	none	none	none	none	none	none	
	Virginia	no	same	full	part	pol/stan, pol/stan	part	part	part	pol	part	none	part	none	none	none	none	none	

pol = policies
stan = standards

1 Authority is cooperative except in review/approval of IRM acquisitions:

2 Review/approval of acquisition limited to state network impact.

3 Involved with policy and standards discussion for all of the above without direct authority.

4 Use of DIT is optional.

Group 1 = Population of 2 million or less

Group 2 = Population of 2 to 4 million

Group 3 = Population of 4 to 6 million

Group 4 = Population greater than 6 million

Table 11. CIO's Functional Authority

Chief Information Officer (CIO)													
States With CIO	Authority Sets IRM Commission	Data Processing	Telecommunications	Office Automation	Systems Development	Data Administration	IRM Acquisition	IRM Facilities	IRM Personnel	Public Access	Other	Comment	
Delaware	no	full	full	full	full	full	full	full	full	none	none	-	
Idaho	no	full	full	full	full	full	full	full	partial	full	none	-	
Maine	no	full	full	full	full	full	full	full	partial	partial	none	-	
Montana	no	full	partial	full	partial	partial	partial	partial	partial	partial	none	-	
Nevada	no	full	full	partial	partial	none	full	full	none	full	full	-	
New Mexico	no	full	full	full	full	full	full	full	full	full	full	-	
North Dakota	no	full	full	full	full	full	full	full	partial	full	full	-	
South Dakota	no	full	full	full	full	full	full	full	none	partial	none	-	
Arizona	no	full	full	full	partial	partial	partial	none	none	none	none	-	
Arkansas	no	full	full	partial	full	none	full	none	none	partial	none	-	
Colorado	same	full	full	full	full	full	full	full	full	full	none	-	
Kansas	no	full	full	partial	full	partial	full	full	partial	full	none	-	
Kentucky	no	full	full	partial	full	full	full	full	full	full	full	-	
Mississippi	same	full	full	full	full	full	full	full	full	full	full	-	
Oregon	no	full	full	full	full	full	full	full	full	partial	full	-	
South Carolina	no	full	full	full	full	full	full	full	full	full	full	-	
Alabama	no	full	partial	full	full	partial	full	full	partial	full	full	-	
Maryland	no	partial	full	full	full	full	full	full	partial	full	none	-	
Minnesota	no	full	full	partial	full	full	full	full	partial	full	none	-	
Tennessee	no	full	partial	full	partial	full	partial	full	partial	partial	none	-	
Washington	no	partial	full	full	full	partial	full	full	partial	partial	none	-	
Wisconsin	same	full	full	full	full	full	full	full	none	none	none	-	
California	no	full	partial	full	full	full	full	partial	full	full	none	-	
Florida	same	full	full	full	full	partial	full	partial	partial	partial	none	-	
Illinois	no	full	full	full	full	full	full	partial	partial	partial	none	-	
North Carolina	same	full	full	full	full	full	full	none	full	partial	none	-	
Ohio	no	full	full	full	full	full	full	none	full	full	none	-	
Pennsylvania	no	full	full	full	full	partial	full	full	partial	full	none	-	
Texas	same	full	partial	partial	partial	partial	partial	partial	partial	partial	partial	-	
Virginia	no	partial	partial	partial	partial	partial	partial	partial	none	partial	none	(DIT) ⁴	
	same	partial	partial	partial	partial	partial	partial	partial	none	none	(CIM) ⁴		

1 CIO sets standards for above areas.

2 Standards, policies and procedures

3 Manages service delivery functions in addition to policy responsibilities.

4 Although Department of Information Technology (DIT) provides these functions and Council of Information Management (CIM) approves policies, standards and guidelines addressing these functions, neither has management authority over these agency functions.

Group 1 = Population of 2 million or less; Group 2 = Population of 2 to 4 million; Group 3 = Population of 4 to 6 million; Group 4 = Population greater than 6 million

G. Chief Information Officer Comparisons (Continued)

G. Chief Information Officer Comparisons (Continued)

Table 12. Authority and Scope of CIO Decisions

Chief Information Officer (CIO)													
States With CIO	Are the CIO's Decisions Binding?	Approves State ITM / Plans	Approves State ITM Policies	Approves State ITM Standards	Approves ITM Services for Shared Services	Approves ITM Strategic Plan	Approves ITM Organization	Approves ITM Budgets	Approves Department ITM Budgets	Approves Classification of State ITM Operations	Approves Classification for Department ITM	Approves State-level ITM Acquisitions	Approves Departmental ITM Acquisitions
Group 1	Yes	Yes	Yes	No	Yes ¹	No	Yes ¹	No	No	No	Yes	Yes	Yes
	+ ¹	Yes	No	No	No	No	No	Yes ¹	Yes ¹	No	Yes	Yes	Yes
	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
	+ ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	+ ¹	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
	Yes ⁴	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
	+ ¹	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Group 2	Yes ³	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes
	+ ¹	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes
	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	N/A	No	No	Yes	Yes	Yes	Yes
	Yes ⁷	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Group 3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes ¹¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes
Group 4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes
	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No
	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
	+ ¹²	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No

Table 12. CIO Decisions

Footnotes:

+ In some but not in others

- 1 Agency director can override unless purchasing laws could be violated.
- 2 Some
- 3 In conjunction with budget office.
- 4 There are six departments in the executive branch which are statutorily exempt from this question.
- 5 Codified law requires Bureau of Administration approval for data processing, telecommunications and office systems hardware, software and services.
- 6 Within executive branch
- 7 For centralized service only.
- 8 Partial
- 9 Advisory
- 10 Recommendations only to legislature and governor.
- 11 The enforcement mechanism is delegated acquisition authority; failure to comply with policy may result in loss of authority to purchase goods and services.
- 12 Departmental actions must comply with state IRM standards, policies and the strategic direction of the Information Technology Commission. Within those constraints departmental IRM management may exercise considerable latitude in decision making.
- 13 Indirectly by approving plans
- 14 DIT = director of Information Technology; CIM = director of the Council of Information Management.
- 15 May approve standards that affect those departments that use DIT.

Group 1 = Population of 2 million or less

Group 2 = Population of 2 to 4 million

Group 3 = Population of 4 to 6 million

Group 4 = Population greater than 6 million

Table 13. Central IRM Organizations

	Group	Central IRM Organization						State-level Planning Organization						State-level Policy and Standards Organization							
		Director is CIO	Direct Reports To	IS & Section of IRM Commission	IS & Section of Parent Organization	Total Budget (\$ Million)	IS & State Level Plan Organization	Director Report To	Section of Central Organization	Total Budget (\$ Million)	% Funded Appropriations	% Funded Receipts	% Funded Other	IS & State Policy/Standards Organization	Director Reports To	Section of Central Organization	Total Budget (\$ Million)	% Funded Appropriations	% Funded Receipts	% Funded Other	
Group 1	Delaware	yes	+	no	yes	14.0	yes++	CIO	yes	0.7	100.0	0.0	0.0	yes++	other	yes	14.0	87.2	12.8	0.0	
	Idaho	yes	+	no	yes	0.2	yes	CIO	yes	0.0	0.0	0.0	0.0	no	other	no	N/A	N/A	N/A	N/A	
	Maine	yes	+	-	-	32.0	yes	CIO	yes	0.3	60.0	40.0	0.0	yes++	other	no	0.2	0.0	100.0	0.0	
	Montana	N/A	-	-	-	-	-	CIO	no	0.2	0.0	100.0	0.0	yes++	other	yes	0.4	0.0	100.0	N/A	
	Nevada	yes	+	no	no	8.9	yes	CIO	yes	4.0	0.0	100.0	0.0	yes	other	N/A	N/A	N/A	N/A	N/A	
	New Hampshire	N/A	-	-	-	-	-	CIO	N/A	N/A	N/A	N/A	N/A	yes++	other	no	0.2	100.0	0.0	0.0	
	New Mexico	yes	+	no	yes	25.3	yes	other	no	0.3	100.0	0.0	0.0	yes++	other	yes	18.0	0.0	100.0	0.0	
	North Dakota	yes	+	no	yes	18.0	yes++	other	yes	18.0	0.0	100.0	0.0	yes++	other	-	-	-	-	-	
Group 2	Rhode Island	yes	+	other	no	7.5	yes	other	yes	7.5	0.0	100.0	0.0	no	no	-	-	-	-	-	
	South Dakota	yes	+	no	yes	13.7	no	other	no	0.0	0.0	0.0	0.0	no	-	-	-	-	-	-	
	Arizona	no	-	-	-	-	yes	other	N/A	0.0	100.0	0.0	0.0	yes++	other	N/A	0.0	100.0	0.0	0.0	
	Arkansas	yes	+	other	no	no	24.0	yes++	other	yes	0.0	0.0	0.0	yes	yes	0.0	0.0	0.0	0.0	0.0	
	Connecticut	no	-	other	no	yes	20.0	yes	other	yes	1.8	100.0	0.0	0.0	yes++	other	yes	1.8	0.0	0.0	0.0
	Kansas	yes	+	no	yes	N/A	yes++	other	yes	0.0	0.0	0.0	0.0	yes++	other	yes	0.0	0.0	0.0	0.0	
	Kentucky	yes ¹	+	yes	no	0.0	yes++	other	yes	0.0	0.0	0.0	0.0	yes++	other	yes	12.6	0.0	100.0	0.0	
	Mississippi	yes	comm	yes	no	4.0	yes	CIO	yes	1.8	0.0	100.0	0.0	yes++	comm.	CIO	N/A	0.0	100.0	0.0	
Group 3	Oregon	yes	+	comm	yes	no	yes	other	yes	1.0	0.0	100.0	0.0	yes++	yes	yes	43.0	7.0	83.0	0.0	
	Alabama	yes	other	no	yes	43.0	yes++	other	yes	43.0	7.0	93.0	0.0	yes++	other	yes	43.0	7.0	83.0	0.0	
	Maryland	N/A	-	-	yes	-	-	other	N/A	0.5	100.0	0.0	0.0	yes++	other	N/A	0.5	0.0	100.0	0.0	
	Minnesota	yes	+	no	yes	1.6	yes++	other	yes	1.6	100.0	0.0	0.0	yes++	other	yes	1.6	100.0	0.0	0.0	
	Tennessee	yes	+	no	yes	54.0	no	-	-	-	-	-	-	yes++	no	N/A	0.0	0.0	0.0	0.0	
	Washington	yes	+	no	no	97.1	yes	CIO	yes	1.3	100.0	0.0	0.0	yes++	other	yes	0.0	0.0	100.0	0.0	
	Wisconsin	no	CIO	no	yes	0.0	yes++	CIO	yes	0.0	0.0	100.0	0.0	yes++	CIO	yes	0.0	0.0	100.0	0.0	
	Group 4	California	N/A	-	yes	-	-	other	N/A	2.7	90.0	10.0	0.0	yes++	comm.	yes	1.0	100.0	0.0	0.0	
	Florida	yes	comm	no	yes	1.0	yes++	other	yes	1.0	100.0	0.0	0.0	yes++	other	yes	N/A	0.0	0.0	0.0	
	Georgia	no	other	no	no	0.0	no	-	-	-	-	-	-	yes++	CIO	yes	0.1	0.0	100.0	0.0	
	Illinois	no	CIO	no	yes	1.0	yes	CIO	yes	0.1	0.0	100.0	0.0	yes++	other	yes	13.0	5.0	95.0	0.0	
	Michigan	no	other	no	yes	13.0	yes	other	yes	13.0	5.0	95.0	0.0	yes++	other	yes	0.3	100.0	0.0	0.0	
	Missouri	no	other	no	yes	12.4	yes	other	yes	0.3	100.0	0.0	0.0	yes++	other	-	-	-	-	-	
	New York	N/A	-	-	-	-	yes ²	other	N/A	0.1	100.0	0.0	0.0	yes++	other	yes	0.1	100.0	0.0	0.0	
	North Carolina	yes	+	no	yes	105.6	yes	CIO	yes	0.5	0.0	100.0	0.0	yes++	CIO	yes	0.5	0.0	100.0	0.0	
	Ohio	yes	+	no	yes	1.1	yes++	CIO	yes	1.1	0.0	100.0	0.0	yes++	CIO	yes	1.1	0.0	100.0	0.0	
	Pennsylvania	no	CIO	no	no	-	-	CIO	N/A	0.6	0.0	100.0	0.0	yes++	CIO	N/A	0.6	100.0	0.0	0.0	
	Texas	N/A	-	-	-	79.0	yes ⁴	comm.	no	0.6	0.0	100.0	0.0	yes++	comm.	no	0.6	0.0	100.0	0.0	
	Virginia	yes	-	no	no	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

¹ Confidential - not mandated. The chairperson of the KISC is elected; the CIO is the current chairperson.² Administers an agency-level IRM planning process implemented statewide for 1992-93.³ The DIT is referenced here. However, the CIO also has oversight responsibilities.⁴ CIO is referenced here. The director reports to the commission and the Secretary of Administration.

Group 1 = Population of 2 million or less

Group 2 = Population of 2 to 4 million

Group 3 = Population of 4 to 6 million

Group 4 = Population greater than 6 million

H. Data Processing Managers Contact List

Missouri Senate
House of Representatives
Governor's Office
Office of the Secretary of State
Office of the State Auditor
Office of the State Treasurer
Office of the Attorney General
Office of Administration
Department of Agriculture
Department of Conservation
Department of Corrections
Department of Economic Development
Department of Elem. and Sec. Education
Department of Health
Department of Higher Education
Department of Highway & Transportation
Department of Insurance
Department of Labor and Industrial Relations
Department of Mental Health
Department of Natural Resources
Department of Public Safety
Office of the Adjutant General
(Missouri National Guard)
Department of Revenue
Department of Social Services
MOSERS
Office of the State Courts Administrator

COLLEGES & UNIVERSITIES

Central Missouri State University
Harris-Stowe State College
Lincoln University
Missouri Southern State College
Missouri Western State College
Northeast Missouri State University
Northwest Missouri State University
Southeast Missouri State University
Southwest Missouri State University
University of Missouri

Don Byrd
George W. Hagedorn
Pam Brauner

Max Joyce

Sean Curry
James A. Schutt
Larry Hasenbeck
Lee West
Don Ingli
Mike Hearst
Chris Wilkerson
Rex Peterson
Mary Willingham
Lew Davison
Jim Latteman
Jim Grazier
Mike Benzen
Ron Pinkham
Mike Lynch
LTC Robert Moran

Rick Moore
Joyce Backes
Randy Rippee
Carolyn Steidley

Dr. Mel Franz
Dr. James W. Gorham, Jr.
Ron Langley
Steve Earney
Mark Mabe
Dave Rector
Dr. Jon Rickman
Don A. Krueger
Jeff Morrissey
Linsey Williams

I. Development of IT Technical Standards

Opportunities to develop technology standards for use throughout all state agencies should be evaluated. Missouri government has not implemented standards in many IT areas. For example, the Division of Budget and Planning (state's central budget office for the executive branch) cannot communicate electronic spreadsheets to or from all agencies as it develops the state's budget. This example and others represent serious problems in managing and leading the state forward and are directly or indirectly the result from the lack of IT standards being implemented in the state.

The concept of technology standards is not new to enterprise-wide IT. In fact, in the early days of automation, a single mainframe computing environment provided many defacto IT standards. As more IT vendors entered the hardware and software market IT standards become more varied and oftentimes were not compatible. Previous examples depict the problems resulting from conflicting standards developed for LANs, protocols, addressing conventions, naming conventions and data representation. The lack of networking standards will make it very difficult for the future integration of state agency LANs into one integrated network. In the present and foreseeable future environments, the state will be responsible for selecting and applying IT technical standards which will be used by agencies.

Progress toward adoption of new technology is often done without regard to standardization among state agencies. Statewide standards development is currently defeated when individual agencies procure and implement new technologies without regard to a consensus among other agencies. However, excessive standards limitations in software and hardware may limit important innovations. The state needs to be able to move forward easily to adopt new technologies even when rigorous standards have been implemented. Often, a product defines a standard by its popular acceptance in the automation community.

Many public and private entities have addressed the need to effectively support data interchange by adhering to EDI standards. The state has successfully implemented EDI in two application areas that communicate with federal automated systems. The success and efficiency of these applications provide powerful motivation to implement EDI in additional applications. Standards in this area will be essential.

I. Development of IT Technical Standards (Continued)

The implementation of IT standards has the potential to unite agencies in ways which dramatically improve service to the citizens of Missouri. The opportunity for the state to have wide area networks that effectively support current and future applications is greatly enhanced through the development of standards for local area networking and wide area networking.

The process of an organization developing or adopting certain information transfer and processing standards has been shown to reduce redundancy of data maintenance among subdivisions within organizations. The need of public agencies to interchange data, plus the expanding interconnectivity, offers the significant opportunities to harvest the benefits of standardization. All agencies within state government could provide better service to citizens with this type of restructuring along standardized lines.

In addition to the potential savings realized in support and training costs, improved standards will provide savings in how state government does business. Another area of potential savings will be in cost avoidance in an environment where new interagency systems can be brought into production more rapidly.

The most important and immediate application areas for technology standards include:

- a) local and wide area networking;
- b) EDI applications, E-mail, image transfers, and multi-media objects;
- c) standard for networking protocols and routing of many-to-one data transfers; and
- d) local area networking addresses, naming conventions, messaging conventions and data representation.

Within the area of EDI standardization, many potential applications must be considered. The following are possible targets for EDI in the State:

Job data banks	Purchasing bids
Legislation systems	Vendor payments
State tax returns	Professional certifications
Sales tax returns	Education transcripts
Health care claims	Student loan system
Medicaid claims	Federal systems
Telephone billing	

I. Development of IT Technical Standards (Continued)

Other potential areas to be considered for definition of standards are:

- word processing, spreadsheet, database, and communication software,
- image, storage, retrieval and transmission software,
- publication, and presentation software,
- compression and encryption software,
- geographical information systems (GIS), statistics software,
- object-oriented languages, personal computer languages, fourth generation languages,
- file and document management systems,
- printers and scanners,
- desktop and server maintenance,
- disaster recovery strategies, including backup software.

J. Development of New IT Technology

New technologies to solve business problems in state government should be implemented. Historically, the state has been a follower in adopting new information technologies as the investments generally required are difficult to acquire through the state's budget process. Even with this barrier, the Missouri government has been an early adopter of new IT in several areas. The Division of Employment Security was an early adopter of an imaging technology. Further, a number of agencies have started or are planning to install geographical information systems for various applications.

Advances in information technology are moving at an ever-increasing rate and the state needs to have a formal process and approach to capitalize on them. Technologies such as multimedia, virtual reality, intelligent agents, object oriented programming, mobile computing, relational databases, collaborative computing, etc., may have a substantial positive impact on the state.

The state needs to implement in its IT planning process an approach to evaluate and prioritize new and emerging technologies that will be pervasive in their use across the state. This process would also allow the state to deal with new technology that may have limited application to a few departments or units.

The IT Advisory Board should provide an effective mechanism for the investigation of new technologies that may benefit agencies in reducing costs, avoiding future costs, improving productivity or customer service, or enhancing the infrastructure. The statewide strategic plan should identify which technologies of inter-agency interest will be addressed. Findings may be used to set statewide standards through the strategic plan, and provide input and direction to state agencies.

Centralized funding should be appropriated for the organization from savings realized in other areas. Personnel with broad experience in the data processing field should staff the new virtual organization in a matrix organization approach. Employees from user agencies should be rotated to the group as new technologies are addressed. Vendors should be requested to donate appropriate equipment and participate in equipment testing. Vendor participation and support could be a requirement in bids.

An annual IT conference should be held to make agencies aware of technology directions. This training will help management make informed decisions. State agencies that implement new technologies should also demonstrate those at the conference and educate other state agencies. All agencies should benefit from the experience of a few.

K. Governor's Steering Committee on Information and Data Sharing

Office of Administration	John Boehm
Department of Agriculture	Kyle Vickers
Department of Conservation	Gerald E. Ross
Department of Corrections	Paul Herman
OA/Div. of Data Processing & Telecomm.	Jim Schutt
Department of Economic Development	Mike Hartmann
Department of Elem. & Secondary Education	Terry Stewart
Department of Health	Garland Land
Department of Higher Education	Eldon Wallace
Department of Highways & Transportation	Ray McCray
Department of Insurance	A. W. McPherson
Department of Labor & Industrial Relations	David Mitchem
Department of Mental Health	Mike Benzen
Department of Natural Resources	Sherri Boldt
Department of Public Safety	Mike Lynch
Department of Revenue	Rick Moore
Department of Social Services	Melba Price
National Guard	Lt. Col. Robert Moran
Lt. Governor's Office	John Robinson
Secretary of State's Office	Jim Kolb
State Auditor's Office	
Treasurer's Office	
Attorney General's Office	Sean Curry
Judiciary	Carolyn Steidley
House of Representatives	
Senate	Sen. Wayne Goode
Senate	David Valentine

L. **Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT)**

PART ONE
INTRODUCTION AND GENERAL INFORMATION

1. **Introduction:**

- 1.1 This document constitutes a Request for competitive, sealed proposals from qualified individuals and organizations to provide professional services as the Director of Information Technology for the State of Missouri.
- 1.2 The maximum term of this service shall be for one year with two one year renewals.

2. **Background Information:**

- 1.1 During his campaign, Governor Carnahan committed to establishing a government review commission which would conduct a major review of state government, evaluate its strengths and weaknesses, and prescribe reform.
- 1.2 The review commission was named "The Commission on Management and Productivity" and was charged with making recommendations to the Governor on areas of management and productivity improvement. This is one recommendation approved by the Governor.

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

PART TWO
SCOPE OF WORK

1. General Requirements:

- 1.1 The contractor shall provide professional services as Director of Informational Technology for the State of Missouri (hereinafter referred to as the "state").
- 1.2 The contractor shall provide services on a full time approximate 40 hour per week basis for a period of one (1) year after the effective date of the contract.
 - 1.2.1 The contractor shall be required to be performing contract activities/services for a minimum of eleven months during the original one (1) year contract period.
 - 1.2.2 Therefore the contractor shall be permitted 30 days (1 month), of non-service during the original one year contract period.
 - 1.2.3 By prior written agreement between the contractor and the Chief of Staff, the contractor shall be able to use the 30 days of non-service as needed.
- 1.3 The contractor shall be supervised by the Governor's Chief of Staff.

2. Specific Requirements:

- 2.1 The contractor shall provide professional services in accordance with the following requirements:
 - 2.1.1 Coordinate the creation and revision of a state Information Technology (IT) Plan within one (1) year of the effective date of the contract.
 - 2.1.2 Convene the IT Planning Board and the IT Advisory Board (see Attachment One of this RFB) within 30 days of the effective date of the contract.

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

- 2.1.3 Organize the development and administer the implementation of an IT strategic training program for all agency upper and mid-management professionals and support staff within six (6) months of the effective date of the contract.
- 2.1.4 Through the review of existing and emerging technology standards and issues, direct the statewide adoption of policy, procedures and standards (see Attachment Two of this RFB) within one (1) year of the effective date of the contract.
- 2.1.5 Promote and sponsor new technology research projects via a "technology laboratory" which, through state agency participation, would conduct testing of various hardware and software products, examine different operating systems, and examine the latest in open systems technology. Also sponsor a "technology information center" which would contain technical information regarding IT and its implementation, and a periodic technology fair which would highlight new promising technologies, innovative IT projects of state government and private business, and so forth (see Attachment Three of this RFB). This is to be completed within nine (9) months of the effective date of the contract.
- 2.1.6 Work with the IT Planning Board and the IT Advisory Board to develop system performance measures, including common metrics, for evaluating the effectiveness of all major installations. These measures should be to determine IT utility rightsizing. This is to be completed within six (6) months of the effective date of the contract.
- 2.1.7 Survey the state of IT performance throughout state government considering the state's IT strategic plan, and prepare and submit to the Governor an annual evaluation of IT performance with recommendations for change within one 1 year of the effective date of the contract.
- 2.1.8 Facilitate planning and serve as a liaison to state and national groups.
- 2.1.9 Regulate IT procurement to insure compliance with existing state and agency plans.

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

- 2.1.10 Direct the consolidation of department mainframe data centers into the number required by the IT Planning Board.
- 2.1.11 Direct the consolidation of the state's numerous independent data networks into a single state telecommunications network to improve management, planning, operation, and expansion of function.

3. Other Requirements:

- 3.1 All reports, documentation, and material developed by the contractor as a direct requirement in the contract shall become the property of the state. The contractor shall agree and understand that all discussions with the contractor and all information gained by the contractor as a result of the contractor's performance under the contract shall be confidential and that no reports, documentation, or material prepared, as required by the contract, shall be released to the public without the prior written consent of the Governor's Chief of Staff.
- 3.2 The contractor agrees and understands that the state's agreement to the contract is predicated, in part and among other considerations, on the utilization of the specific individual identified and/or described in the contractor's original proposal. Therefore, the contractor agrees that no substitution of such specific individual during the original contract period. Failure of the specific individual to complete the contract period will cause the contractor to pay \$100.00 per day liquidated damages through the end of the contract period.
- 3.3 The contractor shall agree and understand that office space for the contractor will be provided by the state.
- 3.4 The contractor shall agree and understand that four state staff will be assigned to his office (3 professional and 1 administrative assistant) to assist in completing the tasks as required.

4. Payment and Invoicing Requirements-Original Contract Period:

- 4.1 The contractor shall submit an invoice on a monthly basis for services performed during the monthly period in accordance with the prices specified on Exhibit A and as specified herein.

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

- 4.1.1 The contractor shall support all invoice payments with detailed time sheets indicating the number of days worked on site in Jefferson City and the number of hours worked each day.
- 4.2 The contractor shall be paid the firm fixed monthly price specified on Appendix A for each month during the original contract period. The firm fixed monthly price shall be the only payment/reimbursement due the contractor for services provided, means, lodging, travel/transportation, and all other personnel related expenses.
- 4.3 In the event that the contractor is required to travel to other locations other than Jefferson City, MO in the performance of service under the contract, and if such travel is approved in advance, in writing, by the Chief of Staff, the contractor shall be reimbursed for the actual and reasonable expenses incurred in such travel.
 - 4.3.1 Such reimbursement shall be in accordance with the Office of Administration Travel Regulations and shall be figured using Jefferson City as the beginning and ending location.
- 4.4 Other than the payments and reimbursements specified above, no other payment or reimbursement shall be made to the contractor during the original contract period.

5. Additional Consulting Services-Contract Renewal Periods:

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

PART THREE
PROPOSAL SUBMISSION INFORMATION

1. Submission of Proposals

2. Evaluation Process:

2.1 After determining that a proposal satisfies the mandatory requirements stated in the Request for Proposal, the comparative assessment of the relative benefits and deficiencies of the proposal in relationship to the published evaluation criteria shall be made by using subjective judgement. The award of the contract resulting from this Request for Proposal shall be based on the lowest and best proposal received in accordance with the evaluation criteria stated below:

2.1.1	Cost.....	30 %
2.1.2	Expertise.....	35 %
2.1.3	Experience.....	35 %

2.2 After an initial screening process, an interview shall be conducted by the evaluation team with oversight provided by the Office of Administration, Division of Personnel.

3. Pricing:

3.1 The offeror must provide price(s) as set forth in the pricing page, Appendix A, for all requirements for this Request for Proposal.

4. Offeror's Experience, and Expertise:

4.1 Minimum Education and Experience Qualifications:

4.1.1 Ten years of professional, technical, or administrative information technology experience.

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

Preferred areas of experience and expertise include data center management, information technology planning, policy setting through consensus, standards and procedures adoption, new technology testing, systems performance measurement, acquisition approval, data center consolidation, data communications and teleprocessing, job accounting and chargeback, privacy and security, and applications development.

4.1.2 Graduation from an accredited four year college or university with specialization in computer science or a closely related field.

Graduate work in public or business administration is desirable.

4.2 The experience of the offeror will be considered in the evaluation process. Therefore, the offeror is advised to submit any information which documents successful and reliable experience in past performances, especially those performances related to activities similar to those requirements of the RFB.

4.2.1 The offeror should provide the following information related to previous and current services/contracts which the offeror has performed which are considered relevant to the requirements of the RFB.

- a. Name, address and telephone number of client/contracting agency and a contact person who may be contacted for verification of all information submitted,
- b. Dates of the Service/Contract.
- c. A brief, written description of the specific prior services performed and requirements thereof.
- d. The above information may be shown on the form attached as Appendix B to this RFB or in a similar manner.

4.3 The expertise of the offeror to perform the requirements of this RFB will be considered in the evaluation. Therefore, the offeror should submit detailed information related to the offeror's education, training, and qualifications, particularly related to project management.

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

4.3.1 The offeror should provide a resume including professional references detailing educational qualifications, training and previous work assignments as may relate to this RFB.

4.4 If the offeror is part of a larger organization, the offeror should provide an organizational chart showing the staffing and lines of authority of the organization. The relationship of the proposed project manager within the organization should be shown.

L. **Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)**

PART FOUR
CONTRACTUAL REQUIREMENTS

1. Applicable State Laws and Encumbrances:
2. Conflict of Interest:
3. Remedies:
4. Contract Documents:
5. Amendments to Contracts:
6. Assignments:
7. Communications and Notices:
8. Invoicing and Payments:
9. Bankruptcy or Insolvency:
10. Inventions, Patents, and Copyrights:
11. Titles:
12. Non-Discrimination In Employment:
13. Americans With Disabilities Act:
14. Insurance:
15. Contractor Status:

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

APPENDIX A
PRICING PAGE

Professional Services - Original Contract Period:

The offeror shall state a firm fixed price for each of the following for performing the services required in this Request for Proposal, in accordance with the terms and conditions specified:

1. \$_____ total firm fixed price per month.

Additional Professional Services - Contract Renewal Periods:

2. The offeror shall state a firm fixed price that will be applicable for additional consulting services for each contract period specified below.

First Renewal Period:

\$_____ total firm fixed price per month

Second Renewal Period:

\$_____ total firm fixed price per month

L. Proposed Request for Bid (RFB) for the Position of Director of the Office of Information Technology (IT) (Continued)

APPENDIX B
PRIOR EXPERIENCE

1. Prior Services Performed For:

Company Name:

Address:

Contact Name:

Telephone Number:

Description of Prior Experience:

2. Prior Services Performed For:

Company Name:

Address:

Contact Name:

Telephone Number:

Description of Prior Experience:

3. Prior Services Performed For:

Company Name:

Address:

Contact Name:

Telephone Number:

Description of Prior Experience:

M. Excerpts from International Data Corporation Research Material

General Electric's Corporate Computer Services organization consolidated 4 data centers into one logical center at 2 locations, reducing costs by \$9 million annually.

Federal entities with intentions to consolidate their information processing centers include the Financial Management Service (FMS) of the Treasury Department and the Naval Computer and Telecommunication Station's Washington Data Processing Installation. Ongoing efforts continue at the Department of Agriculture's National Computer Center (NCC) in Kansas City. Expected savings range from \$8.3 million for the FMS over a five-year period to \$20.4 million for the NCC between 1991 to 1994.

Manufacturers Hanover Corporation, the New York money center, recently completed the consolidation of five data centers into two, which also included relocating one site to a new, but less costly, location in Wilmington, DE. Although eventual savings were projected at around \$30 million, some bank officials were initially skeptical of consolidation, says Edward Nyce, the bank's recently retired executive vice president of information technology. "It did take a fair amount of selling," he says, which involved nine months of discussion with 15 top executives representing different areas of the bank. "From a managerial standpoint, it was difficult." Nevertheless, Nyce had the last word--since the 1990 move, the bank has saved "well over \$20 million already."

"Most people think that all you get out of data center consolidation is savings," says Michael Zucchini, executive vice president and chief information officer at Fleet/Norstar Financial Corporation. "You really get three things: savings, improved quality, and faster delivery (of data) to your organization. For example, all the same software (from consolidation and standardization) means that all your banks get their information at the same time. By standardizing systems, eliminating redundancies and whittling away at duplicated data center facilities, Fleet/Norstar's consolidation of Bank of New England's data centers and related operations will save about \$90 million--half of the Boston bank's original \$180 million operating budget.

First of America Bank Corporation, a \$16.5 billion-asset bank holding company based in Kalamazoo, MI, recently consolidated its four data centers into one all-new facility. The bank estimates it will save between \$10 and \$15 million in hardware, software and staffing over the next five years. Additionally, the single-center approach will make it easier to create and install new applications.

Economies of scale stem from reduced operations staffs, not less hardware or software, says David Van Lear, Bank One Services Corporation president and

M. Excerpts from International Data Corporation Research Material (Continued)

CEO. With Bank One's two sites--each with equal MIPS doing 50 percent of the bank's work--the economies of scale and consequent cost savings spring from a greatly reduced staff because one of the facilities is a "lights-out" site using robotics run and operated by the other data center. "We operate two data centers as if they were one; we don't think we'd have any further advantages going to one," Van Lear says.

Cecil Smith, Second Vice President and group information services executive for Bank One, says some will simply chuck their data centers and contract with a third-party processor in a growing trend toward outsourcing. Outsourcing is a vehicle to achieve consolidation, without the bank actually performing the consolidation itself. Large banks can take advantage of consolidation and probably bring to the bottom line as much as outsourcing deals could. Michael Zucchini suggests "If you're spending \$20 million a year on a data center and an outsourcer offers you a contract at \$15 million, you may do it. You get an immediate gain, but you should have been able to run it better in the first place."

Eagan, Minnesota is the site of Unisys's InfoHub, a giant facility that eventually will be the equivalent of all the computer maker's 52 data centers in one building. The company is 80 % of the way through its data center consolidation, which is projected to result in annual savings of more than \$50 million. Gil Piddington, then in charge of worldwide networks, says that for many managers, a nearby data center provides a sense of control and security. "Had we not had a crisis in Unisys, I don't think we could have ever done this politically. **A data center is like a teddy bear; people like to go to bed and know it's there.**" In addition to more than \$50 million in annual data center savings, Unisys expects to save \$15 million from telecommunications consolidation, and \$10 million more from application re-engineering.

Back in the early 1980s, when decentralization was in vogue, Chase Manhattan Bank operated 125 data centers throughout the world. In a massive consolidation effort, Chase is on its way to supporting only six data centers worldwide. Already, the move is saving the bank about \$30 million a year, and by 1995, savings will grow to about \$50 million a year, says Art Ryan, president and chief operating officer.

GTE Corporation estimates it will save \$149 million in labor and overhead by 1992 through its data center consolidation plan. The consolidation will reduce the number of data center employees by 300, or 25 percent, and will eliminate 87,316 square feet of unnecessary floor space. The newly reorganized data centers will also reduce the amount of duplicate effort, enhance information systems management and reduce the cost per billable CPU unit by 51 percent.

N. Article *Emerging Technology*

Emerging Technology

From time to time, articles have been written explaining the Integrated Voice Data Network (IVDN). Mention has also been made to a single data network. It is time to expand the concept that the IVDN and single data network are, or could be one, in the same.

There are several data centers operated and maintained by state agencies on an autonomous basis. Each of these data centers operate a network of communications lines called facilities, which originate at the data center front end processor and terminate at multiple locations that the center serves. An example would be the Missouri State Highway Patrol's MULES (Missouri Uniform Law Enforcement System) network which has a front end processor located in Jefferson City and a facility network which serves MSHP districts statewide, along with most sheriff and police departments statewide.

There are five other similar networks originating in Jefferson City and terminating at each users' data center. As each of these centers operate its own facility network, it is known that there are multiple lines or facilities to any city outside of Jefferson City that has a sheriff's office, a police department, an Employment Security office, a Department of Social Services office, a Department of Revenue office, a Probation and Parole office, etc. This does not take into consideration the Lottery network and various other state agencies such as Department of Natural Resources, Conservation, Insurance, Mental Health and others that have data requirements statewide.

Several years ago, all the aforementioned data circuits were low speed analog circuits, each routed throughout the state at the discretion of the agency that ordered them. The IVDN has bundled those individually routed circuits into large trunk groups between the metropolitan areas. These trunk groups also allow integration of voice into the network thus creating the IVDN. The data circuits are now mostly 56kb digital which, while increasing the speed for data throughput, has at the same time reduced cost to the user agency. The reduction in cost has been accomplished in two ways. First, each agency has reduced the number of lines in use. Second, the bundling of circuits within the IVDN has allowed a bulk rate price from the telephone companies.

The IVDN with its bundling of data circuits and voice circuits could be thought of as a single data network. In

fact in, works like a single pipe between the nodes throughout the network. However, there is still each data center utilizing its portion of each of the pipes to carry only its traffic. A single data network would be where each circuit within the pipe carried traffic for multiple agencies. This sharing of circuits could greatly reduce the cost of those facilities required beyond the IVDN nodes. These circuits, called tail circuits, account for more than half the total cost of all the facilities within the state network.

Cost has been reduced and productivity has been increased with the IVDN concept. The next step should be to reduce the tail circuit costs by providing a means of circuit sharing between agencies. Emerging technologies are being studied to see how that can be done

Frame Relay: What is Frame Relay? To understand Frame Relay one has to have some knowledge of LANs/WANs, switching techniques, data terminal equipment, data communications equipment and to some extent, addressing.

LANs (Local Area Networks): Communications within a local area network involves end stations or clients, communicating over local area network segments usually linked through an internetworking device, such as a router. Traditionally, LAN communications would be within a building or campus environment and is characterized by high throughput, low delay and low error rates.

WANs (Wide Area Networks): Communications occur between geographically separate areas, usually involving a client or host of one LAN communicating with a client or host of a distant LAN. The router within LAN environments represent the LAN/WAN junction points of an internetwork. When a local end station wants to communicate with a remote end station, the router offers the data stream to the WAN through a switching device which selects a data path through the facility network.

Switching Techniques: There are basically three types of switching: Circuit, Message and Packet. Circuit switching is the process of setting up and keeping a circuit open between two or more users so that they have

N. Article *Emerging Technology (Continued)*

exclusive and full use of the circuit until the connection is released.

Message switching is the technique where an input message is stored for a period of time and then sent on to its destination. Normally used when the distant end is unattended; the switch will see the message will keep attempting delivery. This process will free the sender of the message to handle other work. Each message contains a destination address and is transmitted through the facility network on a store and forward basis.

Packet switching is a technique of sending data through the network to the distant end in multiple packets of data each having a unique identification and carrying its destination address. This way each packet can go by a different route which allows end stations to dynamically share the network medium and the available bandwidth. Packets may arrive in a different order than shipped. A packet ID lets the data be reassembled in proper sequence. Packet switching is a very efficient method of moving digital data around, but is not useful for voice or video. Most of todays popular LANs (i.e. Ethernet and Token Ring) are packet-switched networks.

Each switching technique has advantages and disadvantages. Circuit switched networks offer users dedicated bandwidth that cannot be infringed upon by other users. On the other hand, packet switched networks have traditionally offered more flexibility and use network bandwidth more efficiently than circuit switched networks.

Data Terminal Equipment (DTE) and Data Communications Equipment, (DCE) sometimes called Data Circuit Terminating Equipment are some of the most common interfaces in data networks. DTE is just what the name implies: computers, terminals, or routers which act as terminating equipment for a given network. DCE or data communications equipment, connects the terminal equipment to the facility network and is typically equipment with a DSU, modem, or multiplexing device. DCE provides clocking as well as switching services between DTEs.

Frame Relay: What exactly is frame relay? Frame relay is a packet switched network addressing technique which defines a DTE/DCE interface that can statistically multiplex many virtual circuits over a single physical transmission link. In other words, frame relay is a technology offering the connectivity benefits of packet switching while decreasing overhead and thereby increasing throughput.

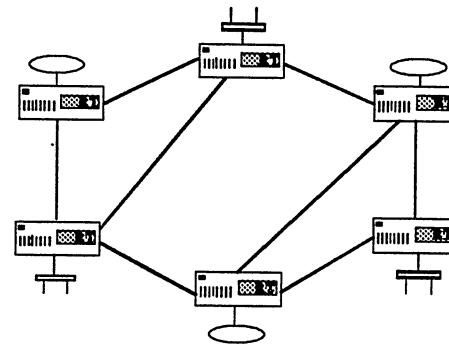
Previous packet switching technology incorporated extensive error checking, retransmission and flow control to ensure data integrity, especially across poor quality lines. Frame relay is based upon the premise that because of the improved reliability of digital and fiber transmission, the overhead can be reduced thereby producing higher speed access to applications. Frame relay also takes into consideration that since each access device does not require a predefined dedi-

cated circuit, bandwidth for multiple network attached devices can be consolidated and dynamically shared via the use of logical virtual circuits. The frame relay device manages the pool of available bandwidth that is shared by all of the network attached access devices. The result is more cost efficient use of bandwidth and device interface ports.

The diagrams depict a standard LAN/WAN using dedicated circuit connectivity as compared to a LAN/WAN using frame relay within the confines of the existing IVDN.

by Larry Bardsley

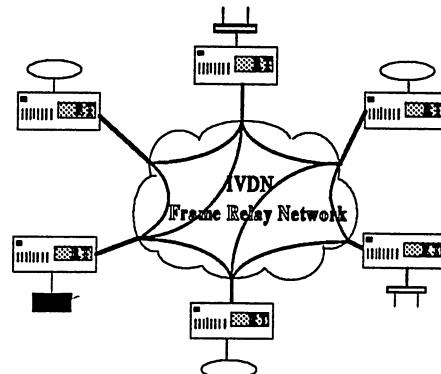
LAN INTERCONNECTION
BEFORE FRAME RELAY



- 6 Backbone Private Lines
- 16 Access Lines to Network
- 16 Router Ports
- Routers burdened with Tandem Traffic

Router (box with 'Router' label)
Token ring LAN (oval with 'Token ring LAN' label)
Ethernet LAN (rectangle with 'Ethernet LAN' label)

IVDN FRAME RELAY NETWORK



- Virtual Mesh Network Via IVDN Frame Relay Network
- Replace Private Lines with Access Line(s)
- Only 6 Access Lines Required to Reach All Destinations
- IVDN Provides Route Diversity and Network Management

Router (box with 'Router' label)
Token ring LAN (oval with 'Token ring LAN' label)
Ethernet LAN (rectangle with 'Ethernet LAN' label)

O. Data Processing Managers Recommendations, July 8, 1994

Data Network Consolidation

The DP Managers concur with the COMAP recommendation with the following addition: The Office of Administration should investigate outsourcing data network consolidation prior to committing to consolidation within the state. The DP Managers do not believe outsourcing with a telecommunications company has been researched in sufficient detail. The Office of Administration should contact likely outsourcing candidates to determine if they can provide the desired consolidated data network services at a lower price and better level of service than could be provided by the Office of Administration.

Chief Information Officer

The CIO position recommended by COMAP should be within the Office of Administration reporting directly to the Commissioner. This would effectively elevate the issues relating to "information" to the cabinet level because the Commissioner reports directly to the Governor. The CIO position and staff would be separate and distinct from the Division of Data Processing and Telecommunications.

The functions of policy making, standards establishment, development of new technology, and information technology planning would be addressed by the Technology Planning and Technology Advisory Boards. The CIO would be a member of both of the boards. These functions tend to be administrative or operational in nature and not directly related to specific state agency programs such as public assistance, health care, education, etc.

The Office of Administration has traditionally served as the Governor's operational department taking care of "day to day" activities such as budget, statewide accounting, state building management, telephone service, etc., that support all state agencies. Duties related to "day to day" data processing services (operation of the state data center, telephone services, programming, etc.) would continue to be the responsibility of the Division of Data Processing and Telecommunications.

Responsibility for mapping the state's information strategy and direction would be given to the CIO position and staff. Statutory authority to review and approve budgetary and purchasing decisions should be granted to the CIO.

The CIO position would be filled by contracting (Automation Task Force's alternative #2) for an individual from an organization that would have no existing financial interest in decisions made by the CIO. By contracting, the state not only gets a qualified individual, but also gets the strength of the organization behind the individual.

No new funds would be required to fund the CIO contract.

O. Data Processing Managers Recommendations, July 8, 1994 (Continued)

Strategic Plan

The DP Managers concur with COMAP in that a state strategic business plan must exist to guide the state's information technology plan. The DP Managers recommend that strategic planning be implemented through a phased approach that takes advantage of existing structures and plans until the development of a strategic business plan can be addressed. Specific recommendations for the phased approach include:

PHASE I:

1. Annually, devote one of the quarterly DP Managers meetings exclusively to strategic planning.
2. Establish strategic planning as a standing agenda item for all quarterly DP Managers meetings.
3. Expand the content of the current annual plan mandated by section 37.005 RSMo to include a section addressing each submitting agency's approach to inter-operability and sharing.
4. Require the Office of Administration, Data Processing and Telecommunication, to officially endorse submitted plans.
5. Take advantage of the window of opportunity referenced by COMAP as outlined under Start Up in the DP Managers recommended Attachment B, Window of Opportunity.

PHASE II:

1. Investigate the use of business process engineering, BPE, or re-engineering, BPR, as a possible technique to assist in the development of the business strategy plan.
2. Recommend coordinating the development of a statewide IT strategic plan as a follow-on to the business strategy plan.
3. Consider the use of the Information Engineering Facility (IEF) as the standard information technology strategic planning tool used by the State of Missouri with no requirement that IEF be used as the follow-on standard development tool. If adopted, the DP Managers Components of the IEF Information Strategy Plan, Attachment A, should replace the components outlined in COMAP's Attachment A, Components of the IT Strategic Plan.
4. Use the State of Missouri's Business Strategy Plan to drive a statewide Information Strategy Plan that will have technology and budgetary recommendations developed for consideration in FY97. The window of development for this recommendation is detailed as the Ongoing time line in the DP Managers Attachment B, Window of Opportunity.

While referenced as phases, the DP Managers Group recommends that the processes run concurrently in order to achieve benefits beginning in fiscal year 1996 and to begin preparation for development of an iterative process that will produce results in each ensuing fiscal year.

O. Data Processing Managers Recommendations, July 8, 1994 (Continued)

Attachment A
Components of an Information Strategy Plan

1. State Strategic Business Plan
2. Initial Assessment
 - Analyze organization structure
 - Identify and prioritize business objectives

Business objects identified include:

 - Mission
 - Goals
 - Objectives
 - Performance Measures
 - Critical Success Factors
 - Information Needs
 - Determine impact of Information Technology on the organization
3. Define the Information Architecture

The Information Architecture models the activities performed by the organization, the data needed to support those activities, and the interaction between the two (in what way do specific activities act upon specific data).

 - Model data requirements of the organization (Data Model)
 - Model activities which must be performed (Activity Model)
 - Examine interaction between data and activities (CRUD Matrix)
 - Map Information Architecture components to business objectives
4. Assess the Current Environment
 - Inventory current systems and data stores
 - Map current environment to proposed Information Architecture to determine coverage
 - Assess the Information Systems Organization
 - Analyze the current technical environment
5. Define the Business System Architecture
 - Build the Business System Architecture Diagram

The BSA diagram is used to demonstrate the coverage of both current and proposed business systems in terms of satisfying information needs, which in turn support the business objectives of the organization.
 - Identify Business Areas
 - Rank Business Area Analysis Projects

O. Data Processing Managers Recommendations, July 8, 1994 (Continued)

Attachment A
Components of an Information Strategy Plan

6. Define the Technical Architecture

The Technical Architecture identifies the technology which will be used to implement the business systems identified in the Business System Architecture.

- Perform Business Area distribution analysis
- Analyze performance requirements
- Analyze technical distribution requirements
- Define and evaluate architectural options

A major strength of the Information Strategy Planning approach is the fact that the business objectives of the organization can be mapped to the business systems to be developed. This ability enables application development projects to be effectively prioritized.

O. Data Processing Managers Recommendations, July 8, 1994 (Continued)

Attachment B
Window of Opportunity

Start Up:

08/01/94	08/24/94	10/01/94	12/15/94	01/01/95
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Recognize DP Manager's Group as Interim IT Planning Board	Fall Quarterly DP Managers Meeting	Deadline for Budget Changes
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Begin IT Planning Process	Coordinate Current DP Plans to Identify Strategic Project Candidates	Submit DP Managers Budgetary Recommendations to Governor	Submit Budget Changes	Governor's Budget Finalized
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Ongoing:

Fiscal Year:

July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
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Quarterly DP Managers Meeting	Quarterly DP Managers Meeting	Quarterly DP Managers Meeting	Quarterly DP Managers Strategic Planning Meeting
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Business Strategy Plan Activities *
Information Strategy Plan Activities **

DP Managers Submit Annual DP Plan	DP & T Endorsement of Department DP Plan Due
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Budget Development Budget to Governor	Deadline for Budget Changes Governor's Budget Finalized
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O. Data Processing Managers Recommendations, July 8, 1994 (Continued)

Attachment B
Window of Opportunity

- * Business Strategy Plan Activities include:
 - Identifying Business Strategy Plan Participants
 - Developing the Business Strategy Plan
 - Commissioning an Information Strategy Plan
 - Annually Updating Business Strategy Plan

- ** Information Strategy Plan Activities include:
 - Identifying Information Strategy Plan Participants
 - Developing the Information Strategy Plan
 - Incorporating ISP Results into Annual DP Plans
 - Annually Updating Information Strategy Plan

Tables

Table 1: Missouri Agency IT Plans, Budgets, Organization and FTE

State Government Entity	Agency IT Strategic Plan (year)	IT Manager Reports To	FY95 IT Budget (\$mil)		Total of FTE	FTE for PC/ LAN Only	% Real Budget "off IT"
			Personal Services	Expense &Equip			
Office of Administration	no	Dpt Dir	2.5	1.9	169	5	See Note (a)
Agriculture	no	Div Dir	0.2	0.03	7	0	
Conservation	no	Div Dir	1.1	1.8	23	9	
Corrections	no	Dpty Dpt Dir	0.8	1.5	31	1	
Economic Development	no	Div Dir	0.8	1.9	25	0	
Elementary & Secondary Education	no	Int. Op. Section	0.5	0.3	20	1	
Health	yes	Div Dir	0.8	0.5	27	2	
Higher Education	no	Div Dir	0.1	0.1	3	1	
Highway & Transportation	yes	Asst. to Dpt Dir	3.0	3.4	101	12	
Insurance	yes	Div Dir	0.2	0.8	8	3	
Mental Health	yes, 1992	Dpt Dir	2.0	2.4	65	3	
Labor & Industrial	no	(b)	3.8	4.7	72	4	
Public Safety	yes, MSHP	Asst. Dpt Dir	2.4	5.1	87	8	
Natural Resources	no	Div Dir	.4	2.2	22	5	
Social Services	no	Assoc. Dpt Dir	6.0	27.5	198	7	
Revenue (incl Lottery)	no	Dpty Dpt Dir	6.2	8.2	251	8.5	
Judiciary	no(c)	St Crt Admin	0.8	0.2	31.5	10	
Governor	no	Dir Admin Serv	0.02	0.04	1	0	
Lieutenant Governor	no	na	0	0	0	0	
Secretary of State	no	Exec Dpty	0.1	0.1	3	0	
State Auditor	no	Dir Admin	0	0.07	0	0	
Attorney General	no	Dir Admin	0.1	0.5	4	1	
State Treasurer	no	Asst Treas	0.03	0.1	1	1	
MO Senate	no	unk	0	0	14	0	
MO House of Rep.	no	Chief Clerk	0	0	8	0	

Source: OA-DP&T Survey, July 1994. Copies of responses are available from OA-DP&T.

Notes: According to agency responses to questionnaire during June 1994, this amount ranges from 0 to over 70 percent.

- (a) DLIR is undergoing reorganization and final data regarding total operations were not available at the time of this report. Data reported are for the Division of Employment Security; others were provided by the Division of Workers' Compensation.
- (b) During 1994, the Missouri Legislature authorized \$7/court case for statewide automation of the Judiciary.

Table 2: Summary Responses to Automation Task Force Questionnaire

State Government Entity	Major IT Changes		How Does Agency Research New Technology	What New Technologies Are Being Investigated
	Last 3-5 Years	Next 3-5 Years		
Office of Admin.	Incorporated new agencies into State Data Center.	Document imaging, budgeting system, statewide e-mail.	No organized plan; done when need arises.	None.
Agriculture	More AS/400, contracting.	More AS/400, extend LAN.	No organized plan.	PCs used for sample analyses.
Conservation	AS/400s, LANs, GIS, reorganization of IT.	State-wide e-mail, research center automation, upgrade PCs, point of sale distribution, WAN, etc.	Vendors, publications, and seminars.	Point of sale terminals, bar coding, multi-media, hand-held computers, and magnetic strip cards.
Corrections	None.	Imaging, LANs.	Vendors, publications, etc.	Imaging and client-server technology.
Economic Development	Away from mainframe to PC.	Greater interconnectivity.	Seminars, reading, MIS laboratory.	Wireless, object oriented tech, voice recognition, multimedia, GIS, etc.
Elem/Sec Ed.	High staff turnover, new mainframe software systems, mainframe upgrade, MOREnet, LAN growth.	Interoperability, GUI, LAN growth, revise legacy systems, relational database use.	Tech contractor, users, data managers, etc.	LAN speed, bandwidth, GIS.
Health	ISP with IEF	Integrated public health system.	Assign staff as needed.	CASE, networking, GIS.
Higher Ed.	MOREnet, AS/400, PC growth.	Internet gopher, public data access.	Literature, conferences, MOREnet staff.	EDI, gopher, MOSAIC, e-mail.
Hwy/Trans.	CADD, IEF developments	Client-server expansion, modernization of legacy systems, business process reengineering	Have IT development workgroup perform this function.	Imaging, electronic forms, document management, distributed databases, WAN, etc.
Insurance	PC growth and LANs.	Greater inconnectivity.	Reading, participation with professional groups.	Relational database, imaging, multimedia, EDI.

State Government Entity	Major IT Changes		How Does Agency Research New Technology	What New Technologies Are Being Investigated
	Last 3-5 Years	Next 3-5 Years		
Mental Health	Consolidate data center, CASE, new network, reduce FTE 30%	Client/server, CASE	As needs exist	Client/server, e-mail, UNIX, CASE, GUI
Labor and Industrial Relations	Document imaging, growth in PCs, and interactive voice response.	Planned department consolidation of IT.	Done by users and programmers.	Reduce use of mail, electronic reporting by employers, KIOSK, etc.
Public Safety	Rightsizing, increase in PC/LAN.	Imaging, GUI, internetworking.	Prototyping, testing.	Image, CASE, networking, group ware.
Natural Resources	None	CASE strategic Planning	No DP staff available	None
Social Services	CASE, TI's IEF.	Development with TI's IEF.	Volunteers	EDI, multimedia.
Revenue (incl Lottery)	Growth in PCs and LANs, bar coding, move away from mainframe, etc.	New hardware and software, open systems environment, etc.	Has technical review board for such, teaming, vendors, etc.	LAN backbone, WAN, electronic transmission of taxes, imaging, etc.
Judiciary	Under development.	Imaging, electronic fund transfer, EDI, etc.	No organized plan	None
Governor	None	None	No organized plan	None
Lieutenant Governor	Added PCs.	Created constituent's database.	No organized plan	None
Secretary of State	Grow LANs, CD-ROM, interconnectivity.	unknown	Publications, vendors, etc.	Imaging, centralized voter registration, etc.
State Auditor	Installed LAN.	None	Research	OCR
Attorney General	Midrange to PC base.	More PC growth.	Reading and investigate when need arises.	None.
State Treasurer	None	Redevelop applications, new hardware.	No organized plan	Client/server, imaging.

Source: OA-DP&T Survey, July 1994.

Table 3: Missouri Agency IT Resources-Hardware

State Government Entity	Number of Mainframes	Number of Midranges	Number of LANs	Number of PCs in Agency (b)
Office of Administration	1	2	7	534
Agriculture	0	1	5	175
Conservation	0	5	30	531
Corrections	0	5	2	611
Economic Development	0	2	5	677
Elementary & Secondary Education	1	8	7	601
Health	0	7	4	2,324
Higher Education	0	1	0	31
Highway & Transportation	2	11	21(c)	2,151
Insurance	0	5	5	255
Mental Health	0	20	25	1,224
Labor & Industrial Relations	1	5	5	255
Public Safety	1	11	16	400
Natural Resources	0	4	17	900
Social Services	1	17	18	998
Revenue (includes Lottery)	0	1	9	1,484
Judiciary	0	2 (a)	67	300(d)
Governor	0	1	0	22
Lieutenant Governor	0	0	0	10
Secretary of State	0	1 (a)	2	124
State Auditor	0	0	2	149
Attorney General	0	3	8	80
State Treasurer	0	1 (a)	1	39
Missouri Senate	0	1	1	40
Missouri House of Representatives	0	2	0	unk

Source: OA-DP&T Survey, July 1994

Notes: RS6000-type computers are categorized as midrange equipment.

(a) Unisys computer. To be phased out in near future.

(b) Based on FY93 MO Annual Plan.

(c) Another 43 networks are planned during FY95.

(d) Does not include county owned devices.

Glossary

Glossary:

Business process reengineering: Examination of central business activities associated with performing the mission of the organization. Study should focus on whether the assumptions originally used to develop the business process are still relevant. If not, the process may be discarded. If so, the process should be reviewed in detail how it is associated with other appropriately designed business processes. Many business processes may be found to contain inefficiencies and redundancies which can be aided, in part, through the application of information technology. Reengineering efforts should not be incremental, not associated with other "management/productivity improvement programs (e.g., TQM, etc.), and can assist in identifying means of achieving orders of magnitude improvements in business performance.

Computer Aided Software Engineering (CASE) Tools: CASE tools are a set of interrelated computer programs that standardize and automate the application systems development process. By generating code from system diagrams, industry publications report that these tools can increase development productivity by a ratio of 2:1 to 3:1. In addition to shortening the development process, CASE tools have the following advantages over traditional systems development.

Improved communication between users and IT professionals: Because CASE tools provide easy to understand diagrams, much like the blueprints architects use, system concepts can be communicated to users much more clearly. With better communications, systems can be developed which are more responsive to users.

Structured development process: CASE tools structure the development steps and thereby produce a standard set of outcomes. This reduces the large variance ordinarily found in conventionally developed systems and makes CASE developed systems easier to maintain and enhance with reported productivity gains of 5:1 to 10:1.

Automated generation of computer programs: This eliminates the manual writing of computer code and the attendant coding errors, thereby allowing users and IT professionals to spend more time defining systems requirements.

Pieces of CASE started to appear in the market place in the early 1980s. Some products assisted in analysis and design. Others generated computer code. It has only been in the last three to four years that fully integrated tools have become available. These integrated tools combine analysis, design, and code generation into a seamless tool that makes significant productivity gains possible.

Glossary: (Continued)

Client-server architecture: The use of multiple computer platforms interactively such that significant data resources are maintained on a large platform, e.g., mainframe or minicomputer, with access to such for downloading and processing to the LAN and PC to maximize the power of the PC for processing and manipulation. Applications developed for a client-server environment use the resources and strengths of multiple computer platforms interactively with limited, if any, intervention by the user.

Computer network: For this application, computer network refers to the sum of all the parts of an integrated system of computers, including mainframe, midrange and PCs, regardless of their relative physical distance apart. Thus, an agency's computer network may indeed be a statewide system by which all users, regardless of physical remoteness, can communicate and share network resources, including data, powerful processing units, and so forth.

Electronic data interchange (EDI): The exchange of data and documents between different users according to standardized rules.

Graphical User Interface: An obvious direction in the computer industry is the adoption of the graphical user interface (GUI) as the method of choice in communicating between the computer user and the computer system. GUIs provide both a common menu structure and a common look and feel between applications running in a particular environment. The key benefit to this commonality is a transfer of learning from one application to another.

Another characteristic of GUIs is the use of icons, small pictures indicating software selection, or some sort of functionality or system action. Icons typically convey information in an intuitive manner rather than forcing the user to memorize command syntax. The combination of the more intuitive icons with a standardized menu structure and location, assists the user in learning and using a computer system more productively.

In indication of industry direction is reflected by the inclusion of a graphical user interface in the majority of PCs sold today.

Hardware: All or part of the physical components of an information processing system, such as computers or peripheral devices.

Glossary: (Continued)

Information chain management: This refers to the fluid communication of strategic business information among the state and its business partners. For state government it present a true value-added product for citizens. A very simple example of a current practice is for a state agency to allow wire transfer of entitlement payments to certain payees of state programs (e.g., school districts, nursing homes, etc.). Another example, although not currently done and more complex than current practice, is for the Division of Employment Security to make on-line access (including file transfer) available to its files regarding claimants of the Unemployment Insurance Fund. Employers pay into this insurance fund for use by their employees who are laid off. At the present, employers don't know in real time which laid off workers have filed for unemployment insurance and the date they may begin drawing upon the employer's contributions. If the employer knew this information and when they needed to rehire workers they could rehire those about to draw insurance, they could a) reduce the draw on their contributions and by so doing could b) prevent their contribution rate to the Unemployment Insurance Fund (a percentage of wages paid) from increasing. The wide application of IT to information chain management practices could dramatically affect decision making and cost savings for the state and many of its business partners.

Information technology: This refers to the sum total, e.g., gestalt, of hardware, software, and the applications possibly using such to impact a business process. The intelligent application of information technology can result in expert systems which truly change the way business is conducted and cause dramatic improvements in productivity and effectiveness. It is **not** the application of computers and software to simply speed up an existing process.

Infrastructure: The underlying foundation or basic framework of a system.

Intelligent Workstations: Industry use of PCs is a response to user demands to be freed from the constraints of centralized data processing, to shorten the development cycles, to freely manipulate and display information, to improve response time, and to have access to better tools. Users are demanding flexibility beyond what can be economically justified by corporate IT, and the PCs meet that demand. There are now thousands of application software packages available to improve personal productivity.

The PC has further enabled distributed processing. A terminal is nothing more than a desk ornament without a mainframe or minicomputer host to provide processing and display capability. The more terminal users demand host services, the larger the host capacity requirement becomes. Personal computers provide their own processing and display capabilities, and make fewer demands upon the host. While PCs may attach to a host, either directly or through a local area network (LAN), to send and receive data, the processing of these data and their presentation can be entirely self contained within the PC. By taking this approach, capacity requirements are transferred from the host to

Glossary: (Continued)

the PC. Since PC processing power is highly scalable with extremely small incremental costs in comparison to minicomputers and mainframes, the result is the capability:

- to reduce host demand and defer high cost growth increments, and
- to target the processing needs of a specific user, thus providing exceptional response time.

This second point bears close consideration. In the mainframe and minicomputer environments, as demand for resources increases, response time degrades. The demand may be spread over many users, or it may result from a single user or application drawing heavily against specific resources. In either case, response time degrades for all users. If these demands are ongoing, the only real solution is to upgrade the mini or mainframe in order to maintain satisfactory response times.

This contrasts with the PC environment where the single user impacts only his own response time in processor intensive applications. Should the user find this unacceptable, only a single workstation need be upgraded. This level of granularity, both in terms of cost and specific user targeting, is the reason the industry is choosing to employ the PC as the workstation of choice.

Local Area and Wide Area Networks (LANs and WANs): Within two years of the introduction and acceptance of PCs in the corporate world, end users began to see the limitations of a stand alone PC. There was a need for sharing and accessing information and resources. This set the stage for the development of physical networks, network operating system software, and file and print servers. These networks of PCs and other resources are known as local area networks (LANs).

The network industry has grown by 40-50 percent annually and in 1991 it had reached roughly \$8 billion in annual sales. LANs have been installed everywhere from the federal, state, and local government levels, through Fortune 1000 companies, hospitals, educational institutions, down to the local video rental store.

Industry analysts predict shifts from LANs, which are assumed to already be in place, to WANs in an effort to leverage existing investments into regional, national, and international networks.

Mainframe: A computer, usually in a computer center, with extensive capabilities and resources to which other computers may be connected so that they can share facilities.

Personal computer: A microcomputer, primarily intended for stand-alone operation but may be connected to mainframes or networks.

Glossary: (Continued)

Relational Database Structure: The relational data model is currently the most popular because it is conceptually simple and understandable. Major strengths of relational database management systems (DBMSs) are flexibility in creating ad hoc reports, the ability to combine and distribute information from different sources, simplicity of design and maintenance, and the ability to add new data and records without disturbing existing programs and applications.

Relational databases are compatible with a large variety of PC and other commercial software. Structured Query Language (SQL) is rapidly becoming an industry-wide standard for accessing relational databases.

Server: A computer can be used to store high access local data (database server), share resources such as printers (resource server), and/or provide access to other computers and outside services (gateway servers). Servers can be mainframes, minicomputers, or PCs. The choice of platform depends on system size and deployment as well as what specific functions the server will perform.

The industry is moving toward using the PC in server architecture because of the significant cost advantages. Additionally, user friendly PC front-end tools allow interaction between a PC, a PC server, and the mainframe.

Minicomputers can be used as servers, but the software tools that would enable the seamless interaction between the minicomputer, PC, and the mainframe platforms are not widely available. Mainframes can be used as servers, but their expense has caused the industry to consider it the server of last resort.

Software: All or part of the programs, procedures, rules, and associated documentation of a data processing system. Software is an intellectual creation that is independent of the medium on which it is recorded.

Strategic Planning Process: Through the determination of its values, mission and goals, an organization may begin to arrive at its strategic business direction and needs, e.g., vision. It can then establish its goals, objectives and implementation strategies. The composite of these activities and their outcomes comprise the organization's Strategic Plan.

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